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# UK METEOROLOGICAL OFFICE
# GLOBAL DATA MONITORING REPORT

**May 2002**

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**Meteorological Office**
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## 1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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## 2 Global Data Monitoring Statistics

### Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

### Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

### Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s$^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s$^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

| Figure | Parameter |
|---|---|
| 4 | Mean wind vectors |
| 5 | Mean observation - background wind vector |
| 6 | Mean observation-background speed (m s$^{-1}$) |
| 7 | RMS observation-background vector (m s$^{-1}$) |

## Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

## Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

| Figure | Parameter Plotted | Layer (hPa) |
|---|---|---|
| 10 | Availability/average daily number | 701-1000 |
| 11 | Vector mean wind (observed) | 701-1000 |
| 12 | Observation-background vector wind difference | 701-1000 |
| 13 | Mean observation-background speed differences | 701-1000 |
| 14 | RMS observation-background vector difference | 701-1000 |
| 15 | Availability/average daily number | 401-700 |
| 16 | Vector mean wind (observed) | 401-700 |
| 17 | Observation-background vector wind difference | 401-700 |
| 18 | Mean observation-background speed differences | 401-700 |
| 19 | RMS observation-background vector difference | 401-700 |
| 20 | Availability/average daily number | 101-400 |
| 21 | Vector mean wind (observed) | 101-400 |
| 22 | Observation-background vector wind difference | 101-400 |
| 23 | Mean observation-background speed differences | 101-400 |
| 24 | RMS observation-background vector difference | 101-400 |

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

| Figure | | Weighting function peak (hPa) |
|---|---|---|
| 26 | Mean | Surface (HIRS8) |
| 27 | SD | Surface (HIRS8) |
| 28 | Mean | 700 (HIRS15) |
| 29 | SD | 700 (HIRS15) |
| 30 | Mean | 500-700 (HIRS11) |
| 31 | SD | 500-700 (HIRS11) |
| 32 | Mean | 400 (HIRS4) |
| 33 | SD | 400 (HIRS4) |
| 34 | Mean | 700 (AMSUA5) |
| 35 | SD | 700 (AMSUA5) |
| 36 | Mean | 300 (AMSUA7) |
| 37 | SD | 300 (AMSUA7) |
| 38 | Mean | 100 (AMSUA9) |
| 39 | RMS | 100 (AMSUA9) |

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

| Figure | | Weighting function peak (hPa) |
|---|---|---|
| 41 | Mean | Surface (HIRS8) |
| 42 | SD | Surface (HIRS8) |
| 43 | Mean | 700 (HIRS15) |
| 44 | SD | 700 (HIRS15) |
| 45 | Mean | 500-700 (HIRS11) |
| 46 | SD | 500-700 (HIRS11) |
| 47 | Mean | 400 (HIRS4) |
| 48 | SD | 400 (HIRS4) |
| 49 | Mean | 700 (AMSUA5) |
| 50 | SD | 700 (AMSUA5) |
| 51 | Mean | 300 (AMSUA7) |
| 52 | SD | 300 (AMSUA7) |
| 53 | Mean | 100 (AMSUA9) |
| 54 | RMS | 100 (AMSUA9) |

## 3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

## Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

## TABLE 1

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for ships, fixed buoys and platforms. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00, 06, 12, 18 UTC |
| **Elements monitored** | | :Mean sea level pressure (hPa).<br>:Wind speed (m $s^{-1}$).<br>:Wind direction (Degrees).<br>:Sea surface temperature (Degrees). |
| **Parameters monitored** | :NOBS | :Number of observations received excluding duplicates. |
| | :PGE | :Percentage of observations with gross errors. |
| | :%REJ | :Percentage of observations flagged excluding those with gross errors. |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors.<br>**N.B. a positive bias indicates the wind observation is veered to the background.** |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors. |
| **GROSS ERROR LIMIT** | :15 hPa (pressure)<br>:25 m $s^{-1}$ (vector wind)<br>:10 degrees (sea surface temperature) | |

| | | | |
|---|---|---|---|
| **SELECTION CRITERIA** | :NOBS | ≥ 20 , and one or more of the following: | |
| | 1.\|bias\| | ≥ 4 hPa | (pressure), |
| | | ≥ 5 m $s^{-1}$ | (wind speed), |
| | | ≥ 30 degrees | (direction). |
| | | ≥ 3 degrees | (sea surface temperature). |
| | 2.SD | ≥ 6 hPa | (pressure), |
| | | ≥ 80 degrees | (direction). |
| | | ≥ 5 degrees | (sea surface temperature). |
| | 3.PGE | ≥ 25 | |

**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m $s^{-1}$**

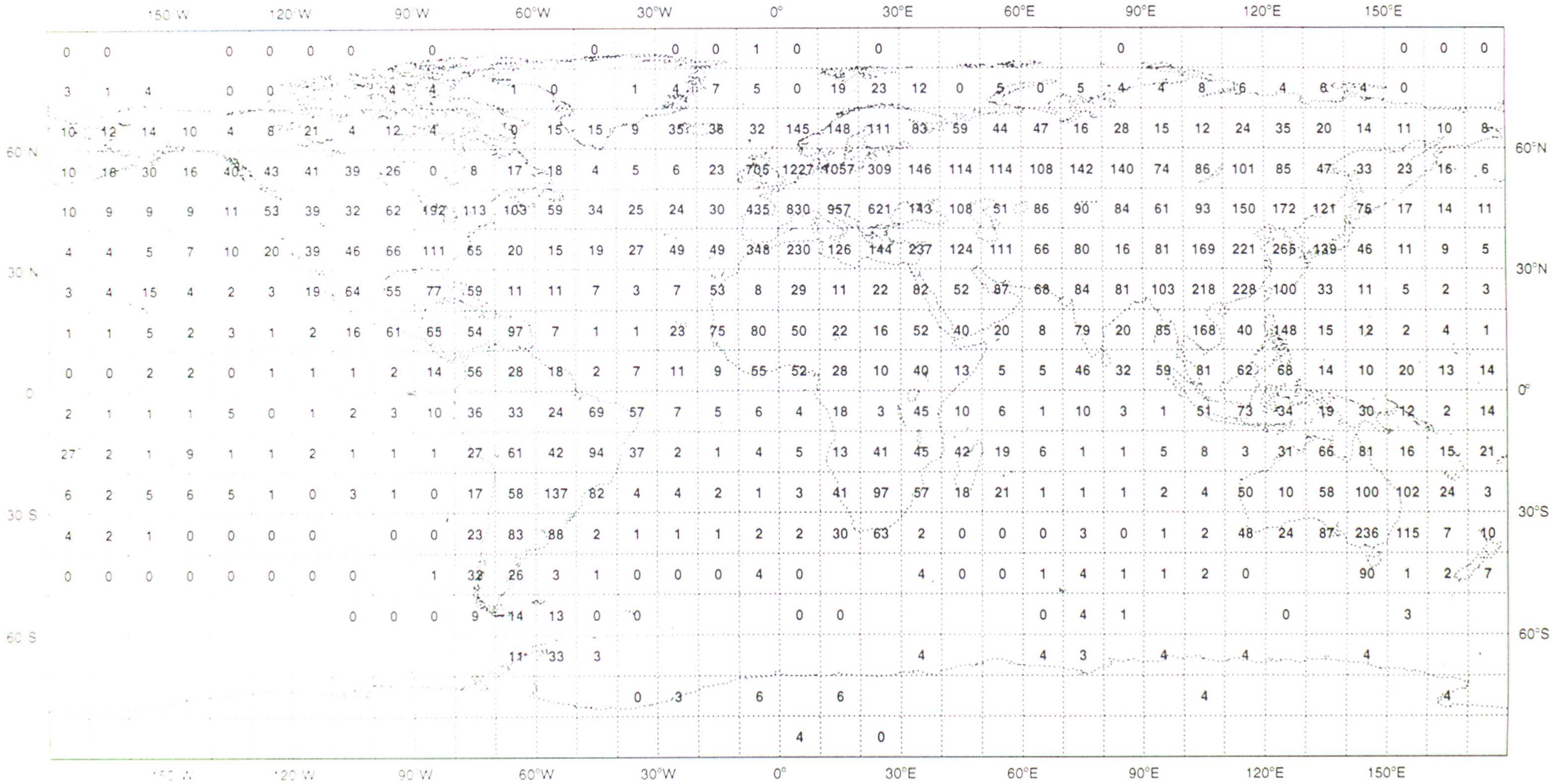
| IDENTIFIER | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | |
| CG2522 | P | 71 | 100 | 100 | | | |
| CG2992 | P | 84 | 100 | 100 | | | |
| C6FE5 | P | 69 | 0 | 80 | 1.4 | -4.5 | 4.7 |
| C6FM8 | P | 28 | 0 | 54 | 4.6 | 5.0 | 6.8 |
| C6QK | P | 26 | 0 | 0 | 1.2 | 7.3 | 7.4 |
| H9PD | P | 30 | 0 | 77 | 1.4 | -5.5 | 5.7 |
| KS000 | P | 138 | 0 | 72 | 5.3 | 7.8 | 9.4 |
| KS003 | P | 58 | 0 | 100 | 0.9 | 6.1 | 6.1 |
| KS006 | P | 154 | 0 | 84 | 2.2 | 6.3 | 6.7 |
| MVLA7 | P | 34 | 0 | 6 | 2.8 | 5.7 | 6.3 |
| OWDD | P | 34 | 0 | 53 | 1.9 | -4.1 | 4.5 |
| PJPO | P | 21 | 0 | 57 | 4.8 | -5.2 | 7.0 |
| P3FZ6 | P | 41 | 2 | 2 | 1.1 | 6.2 | 6.3 |
| P3YS5 | P | 91 | 1 | 2 | 1.4 | 4.2 | 4.4 |
| UAIS | P | 41 | 5 | 63 | 2.9 | -5.9 | 6.6 |
| UBAU | P | 47 | 0 | 2 | 1.7 | -4.9 | 5.2 |
| UBDN | P | 22 | 0 | 0 | 0.8 | 4.3 | 4.4 |
| UCTS | P | 65 | 6 | 77 | 4.8 | -7.8 | 9.1 |
| UGGA | P | 92 | 8 | 63 | 6.8 | -2.4 | 7.2 |
| VGFQ | P | 36 | 83 | 100 | 2.6 | -3.7 | 4.5 |
| XPYM | P | 31 | 0 | 13 | 2.2 | 4.6 | 5.1 |
| 8PNI | P | 22 | 0 | 5 | 1.3 | -4.0 | 4.2 |
| 9VHZ2 | P | 30 | 0 | 0 | 0.8 | -4.3 | 4.4 |
| WINS SPEED | | | | | | | |
| DZSE | SPEED | 38 | 0 | 100 | 2.0 | 6.3 | 6.6 |
| FNOU | SPEED | 20 | 5 | 50 | 6.2 | 9.3 | 11.1 |
| HP6038 | SPEED | 246 | 0 | 0 | 3.1 | 5.5 | 6.4 |
| KS006 | SPEED | 152 | 0 | 1 | 2.3 | -5.7 | 6.1 |
| LAIP5 | SPEED | 37 | 0 | 3 | 3.0 | -6.1 | 6.8 |
| OWDD | SPEED | 27 | 7 | 52 | 7.2 | 9.6 | 12.0 |
| P3EK7 | SPEED | 39 | 0 | 36 | 2.7 | 6.0 | 6.6 |
| V2FN | SPEED | 29 | 7 | 100 | 6.1 | 14.7 | 16.0 |
| WDCJ | SPEED | 26 | 0 | 8 | 3.4 | 5.4 | 6.4 |
| ZCAN3 | SPEED | 34 | 35 | 76 | 8.5 | 2.0 | 8.7 |
| 3FKU7 | SPEED | 20 | 0 | 15 | 2.5 | 6.2 | 6.7 |
| 44145 | SPEED | 244 | 0 | 3 | 4.3 | 5.9 | 7.3 |
| WIND DIRECTION | | | | | | | |
| KS012 | DIRN. | 24 | 4 | 0 | 65.3 | -74.8 | 99.3 |
| OVUN6 | DIRN. | 33 | 0 | 0 | 21.4 | -32.0 | 38.5 |
| ZCAN3 | DIRN. | 21 | 57 | 0 | 60.3 | 122.1 | 136.2 |
| 23099 | DIRN. | 20 | 0 | 0 | 82.1 | 11.5 | 82.9 |
| 23102 | DIRN. | 38 | 0 | 0 | 95.5 | 38.5 | 103.0 |
| SEA SURFACE TEMPERATURE | | | | | | | |
| CGDS | SST | 108 | 16 | 100 | 1.9 | 4.2 | 4.6 |
| CG2350 | SST | 281 | 30 | 33 | 1.7 | 1.4 | 2.3 |
| CG2522 | SST | 25 | 48 | 100 | 1.5 | 7.4 | 7.6 |
| CG2960 | SST | 356 | 7 | 100 | 2.0 | 3.9 | 4.4 |
| CG2992 | SST | 64 | 100 | 100 | | | |
| CG8048 | SST | 60 | 100 | 100 | | | |
| CYMD | SST | 52 | 25 | 29 | 1.6 | 1.6 | 2.3 |
| C6MS4 | SST | 42 | 2 | 100 | 1.6 | -4.2 | 4.5 |
| C6QO9 | SST | 28 | 0 | 100 | 1.2 | 4.9 | 5.1 |
| DBBX | SST | 329 | 56 | 100 | 0.7 | 0.1 | 0.7 |
| DEDI | SST | 291 | 73 | 73 | 1.4 | 0.3 | 1.4 |
| DGOS | SST | 24 | 46 | 54 | 2.9 | 0.1 | 3.0 |
| DQVG | SST | 65 | 0 | 82 | 1.8 | 3.4 | 3.9 |
| ELOG5 | SST | 62 | 0 | 90 | 1.7 | 4.3 | 4.7 |
| ELVO5 | SST | 30 | 0 | 100 | 2.0 | -3.1 | 3.7 |

| IDENTIFIER | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|
| ELZY4 | SST | 52 | 2 | 62 | 2.7 | 4.2 | 5.0 |
| H9IL | SST | 21 | 5 | 100 | 2.7 | 3.4 | 4.3 |
| H9IM | SST | 22 | 0 | 100 | 1.0 | 4.1 | 4.2 |
| H9PD | SST | 30 | 27 | 40 | 3.4 | -0.6 | 3.5 |
| H9RS | SST | 59 | 14 | 100 | 1.9 | 6.3 | 6.6 |
| JADY | SST | 37 | 0 | 100 | 1.2 | 5.2 | 5.4 |
| KS003 | SST | 56 | 5 | 100 | 0.8 | -3.8 | 3.9 |
| LAJV4 | SST | 26 | 4 | 100 | 2.9 | 4.7 | 5.5 |
| LAON4 | SST | 64 | 53 | 58 | 2.2 | 1.1 | 2.5 |
| OENC | SST | 64 | 28 | 34 | 2.5 | -1.2 | 2.8 |
| PIAN | SST | 65 | 2 | 15 | 1.1 | 3.1 | 3.3 |
| PJJE | SST | 28 | 93 | 93 | 0.8 | -0.3 | 0.8 |
| PJOX | SST | 31 | 0 | 100 | 0.6 | -5.5 | 5.5 |
| SHIPEU | SST | 34 | 26 | 59 | 1.0 | 0.4 | 1.1 |
| SIWB | SST | 20 | 0 | 95 | 2.1 | 5.5 | 5.9 |
| TSMS | SST | 86 | 1 | 100 | 1.5 | -3.9 | 4.2 |
| VCFW | SST | 22 | 27 | 36 | 2.3 | -1.0 | 2.5 |
| VGLZ | SST | 42 | 100 | 100 | | | |
| VOCJ | SST | 250 | 2 | 100 | 2.2 | 4.2 | 4.7 |
| VSUA7 | SST | 21 | 0 | 86 | 2.1 | -5.4 | 5.8 |
| WCQ8110 | SST | 34 | 38 | 41 | 2.2 | -0.5 | 2.2 |
| WCW9126 | SST | 38 | 82 | 82 | 1.1 | 0.2 | 1.1 |
| WCZ9380 | SST | 24 | 0 | 100 | 1.0 | 6.6 | 6.7 |
| YJQL3 | SST | 33 | 0 | 100 | 0.7 | -5.0 | 5.1 |
| ZQVN7 | SST | 29 | 0 | 48 | 2.1 | -3.0 | 3.6 |
| 3FDZ5 | SST | 25 | 0 | 100 | 0.6 | 3.2 | 3.3 |
| 3FJV4 | SST | 23 | 0 | 100 | 0.6 | 3.5 | 3.6 |
| 44137 | SST | 717 | 0 | 100 | 1.6 | 3.5 | 3.9 |
| 45147 | SST | 698 | 100 | 100 | | | |
| 45151 | SST | 386 | 4 | 100 | 1.1 | 6.4 | 6.5 |
| 45152 | SST | 675 | 100 | 100 | | | |
| 46131 | SST | 342 | 100 | 100 | | | |
| 46146 | SST | 713 | 100 | 100 | | | |
| 46181 | SST | 710 | 100 | 100 | | | |

Figure 1. SHIP/SYNOP mean daily count. MAY 2002

Main hours only

Global average number of observations in 24 hours = 21101



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | 0 | 0 | 0 | 0 | | 0 | | | | 0 | | 0 | 0 | 1 | 0 | | 0 | | | | | | 0 | | | | | | | 0 | 0 | 0 |
| 3 | 1 | 4 | | 0 | 0 | | | 4 | 4 | | 1 | 0 | | 1 | 4 | 7 | 5 | 0 | 19 | 23 | 12 | 0 | 5 | 0 | 5 | 4 | 4 | 8 | 6 | 4 | 6 | 4 | 0 | | |
| 10 | 12 | 14 | 10 | 4 | 8 | 21 | 4 | 12 | 4 | | 0 | 15 | 15 | 9 | 35 | 38 | 32 | 145 | 148 | 111 | 83 | 59 | 44 | 47 | 16 | 28 | 15 | 12 | 24 | 35 | 20 | 14 | 11 | 10 | 8 |
| 10 | 18 | 30 | 16 | 40 | 43 | 41 | 39 | 26 | 0 | 8 | 17 | 18 | 4 | 5 | 6 | 23 | 705 | 1227 | 1057 | 309 | 146 | 114 | 114 | 108 | 142 | 140 | 74 | 86 | 101 | 85 | 47 | 33 | 23 | 16 | 6 |
| 10 | 9 | 9 | 9 | 11 | 53 | 39 | 32 | 62 | 192 | 113 | 103 | 59 | 34 | 25 | 24 | 30 | 435 | 830 | 957 | 621 | 143 | 108 | 51 | 86 | 90 | 84 | 61 | 93 | 150 | 172 | 121 | 76 | 17 | 14 | 11 |
| 4 | 4 | 5 | 7 | 10 | 20 | 39 | 46 | 66 | 111 | 65 | 20 | 15 | 19 | 27 | 49 | 49 | 348 | 230 | 126 | 144 | 237 | 124 | 111 | 66 | 80 | 16 | 81 | 169 | 221 | 265 | 139 | 46 | 11 | 9 | 5 |
| 3 | 4 | 15 | 4 | 2 | 3 | 19 | 64 | 55 | 77 | 59 | 11 | 11 | 7 | 3 | 7 | 53 | 8 | 29 | 11 | 22 | 82 | 52 | 87 | 68 | 84 | 81 | 103 | 218 | 228 | 100 | 33 | 11 | 5 | 2 | 3 |
| 1 | 1 | 5 | 2 | 3 | 1 | 2 | 16 | 61 | 65 | 54 | 97 | 7 | 1 | 1 | 23 | 75 | 80 | 50 | 22 | 16 | 52 | 40 | 20 | 8 | 79 | 20 | 85 | 168 | 40 | 148 | 15 | 12 | 2 | 4 | 1 |
| 0 | 0 | 2 | 2 | 0 | 1 | 1 | 1 | 2 | 14 | 56 | 28 | 18 | 2 | 7 | 11 | 9 | 55 | 52 | 28 | 10 | 40 | 13 | 5 | 5 | 46 | 32 | 59 | 81 | 62 | 68 | 14 | 10 | 20 | 13 | 14 |
| 2 | 1 | 1 | 1 | 5 | 0 | 1 | 2 | 3 | 10 | 36 | 33 | 24 | 69 | 57 | 7 | 5 | 6 | 4 | 18 | 3 | 45 | 10 | 6 | 1 | 10 | 3 | 1 | 51 | 73 | 34 | 19 | 30 | 12 | 2 | 14 |
| 27 | 2 | 1 | 9 | 1 | 1 | 2 | 1 | 1 | 1 | 27 | 61 | 42 | 94 | 37 | 2 | 1 | 4 | 5 | 13 | 41 | 45 | 42 | 19 | 6 | 1 | 1 | 5 | 8 | 3 | 31 | 66 | 81 | 16 | 15 | 21 |
| 6 | 2 | 5 | 6 | 5 | 1 | 0 | 3 | 1 | 0 | 17 | 58 | 137 | 82 | 4 | 4 | 2 | 1 | 3 | 41 | 97 | 57 | 18 | 21 | 1 | 1 | 1 | 2 | 4 | 50 | 10 | 58 | 100 | 102 | 24 | 3 |
| 4 | 2 | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 23 | 83 | 88 | 2 | 1 | 1 | 1 | 2 | 2 | 30 | 63 | 2 | 0 | 0 | 0 | 3 | 0 | 1 | 2 | 48 | 24 | 87 | 236 | 115 | 7 | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 | 32 | 26 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | | | 4 | 0 | 0 | 1 | 4 | 1 | 1 | 2 | 0 | | | 90 | 1 | 2 | 7 |
| | | | | | | | 0 | 0 | 0 | 9 | 14 | 13 | 0 | 0 | | | | 0 | 0 | | | | | 0 | 4 | 1 | | | | 0 | | | 3 | | |
| | | | | | | | | | | | 11 | 33 | 3 | | | | | | | | 4 | | | 4 | 3 | | 4 | | 4 | | | 4 | | | |
| | | | | | | | | | | | | | | 0 | 3 | | 6 | | 6 | | | | | | | | | 4 | | | | | | 4 | |
| | | | | | | | | | | | | | | | | | | 4 | | 0 | | | | | | | | | | | | | | | |

## TABLE 2

## MONITORING OF MARINE SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - DRIFTING BUOYS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

| | | | |
|---|---|---|---|
| **Monitoring procedures** | | | |
| **Period** | | :One calendar month. | |
| **Data monitored** | | :Reports from each unique identifier for drifting buoys. | |
| **Standard of comparison** | | :Background field from UKMO global model. | |
| **Position** | | :Average latitude and longitude for period. | |
| **Observation times** | | :00, 06, 12, 18 UTC | |
| **Elements monitored** | | :Mean sea level pressure (hPa).<br>:Wind speed (m s$^{-1}$).<br>:Wind direction (degrees).<br>:Sea surface temperature (degrees). | |
| **Parameters monitored** | :NOBS | :Number of observations received excluding duplicates. | |
| | :PGE | :Percentage of observations with gross errors. | |
| | :%REJ | : Percentage of observations flagged excluding those with gross errors | |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. | |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors.<br>**N.B. a positive bias indicates the wind observation is veered to the background.** | |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors. | |
| GROSS ERROR LIMIT | :15 hPa<br>:25 m s$^{-1}$<br>:10 degrees | (pressure)<br>(vector wind)<br>(sea surface temperature) | |
| SELECTION CRITERIA : | NOBS | ≥ 20 , and one or more of the following. | |
| | 1.\|bias\| | ≥ 4 hPa | (pressure), |
| | | ≥ 5 m s$^{-1}$ | (wind speed), |
| | | ≥ 30 degrees | (direction). |
| | | ≥ 3 degrees | (sea surface temperature) |
| | 2.SD | ≥ 6 hPa | (pressure), |
| | | ≥ 80 degrees | (direction). |
| | | ≥ 5 degrees | (sea surface temperature) |
| | 3.PGE | ≥ 25. | |

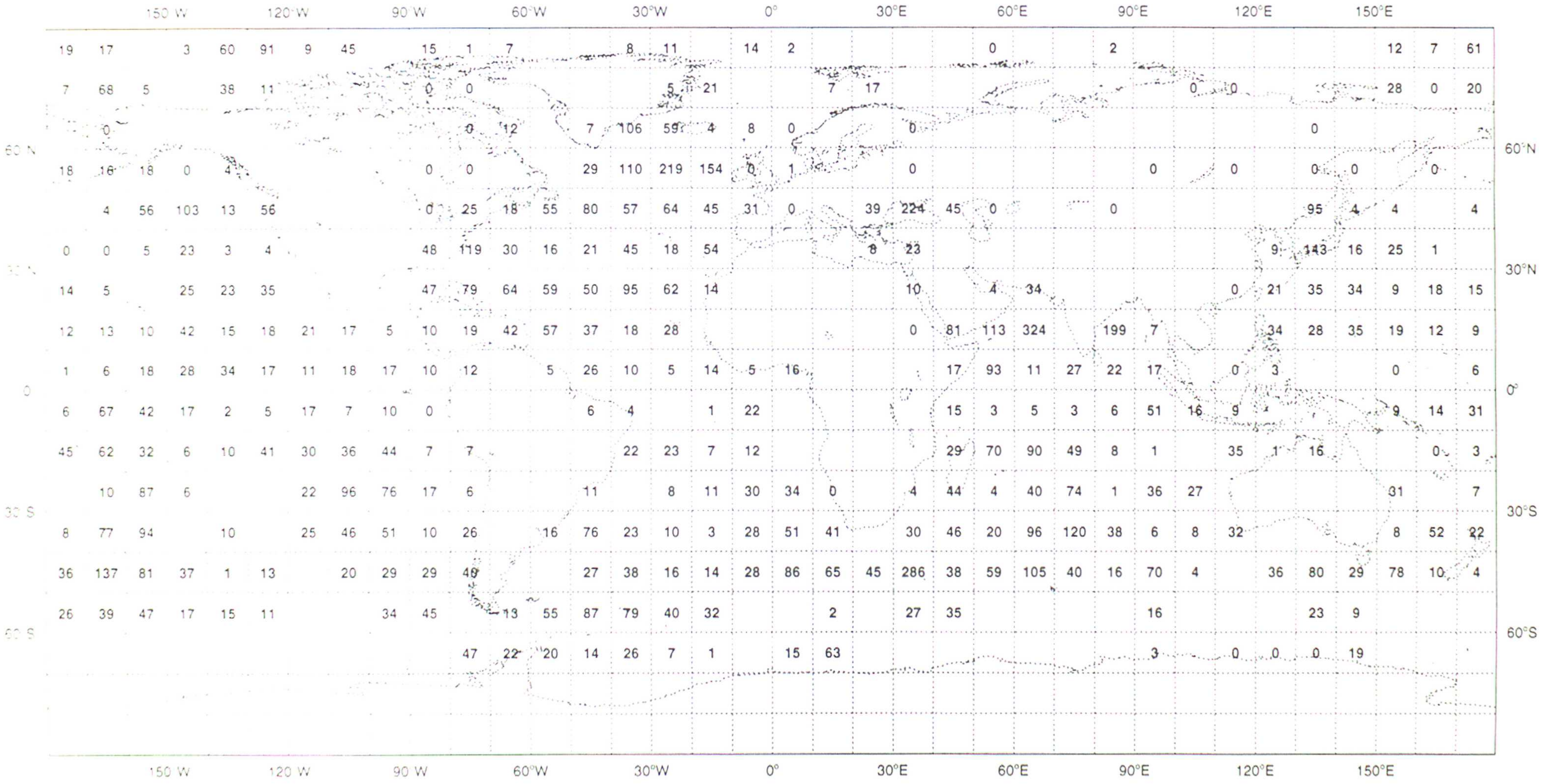
**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s$^{-1}$**

| IDENTIFIER | LAT. | LONG. | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | |
| 21534 | 42.1 | 138.5 | P | 1121 | 87 | 100 | 1.7 | 13.6 | 13.7 |
| 25541 | 83.7 | 83.7 | P | 68 | 1 | 100 | 2.3 | -7.6 | 7.9 |
| 44505 | 48.6 | -49.4 | P | 57 | 88 | 89 | 0.4 | -0.6 | 0.7 |
| 61533 | 33.3 | 33.6 | P | 24 | 83 | 100 | 0.6 | 14.1 | 14.1 |
| 61654 | 45.0 | 35.4 | P | 20 | 65 | 100 | 11.1 | 3.3 | 11.6 |
| WIND SPEED | | | | | | | | | |
| 23924 | 12.6 | 87.4 | SPEED | 253 | 10 | 100 | 1.9 | 12.1 | 12.3 |
| 41557 | 21.0 | -70.8 | SPEED | 347 | 63 | 100 | 6.7 | 14.2 | 15.7 |
| 53550 | -11.9 | 114.9 | SPEED | 35 | 0 | 100 | 1.5 | -7.8 | 7.9 |
| WIND DIRCTION | | | | | | | | | |
| 23924 | 12.6 | 87.4 | DIRN. | 188 | 13 | 0 | 32.5 | 85.5 | 91.5 |
| SEA SURFACE TEMPERATURE | | | | | | | | | |
| 16950 | -35.7 | 75.8 | SST | 103 | 0 | 100 | 1.9 | -5.6 | 5.9 |
| 23911 | 12.6 | 87.7 | SST | 237 | 56 | 100 | 5.1 | 0.0 | 5.1 |
| 23912 | 2.6 | 72.9 | SST | 53 | 40 | 43 | 0.2 | -0.2 | 0.3 |
| 33502 | -32.2 | -18.9 | SST | 109 | 0 | 100 | 0.4 | 4.4 | 4.5 |
| 44621 | 63.3 | -36.5 | SST | 1563 | 0 | 73 | 2.5 | 4.0 | 4.7 |
| 46972 | 22.0 | -130.1 | SST | 193 | 0 | 100 | 0.3 | 3.2 | 3.2 |
| 51648 | -16.5 | -151.8 | SST | 75 | 0 | 92 | 2.8 | -3.2 | 4.2 |
| 53550 | -11.5 | 116.3 | SST | 49 | 98 | 98 | 0.0 | -1.0 | 1.0 |
| 55911 | -52.5 | -123.0 | SST | 338 | 0 | 100 | 0.4 | 6.4 | 6.4 |
| 61528 | 41.8 | 36.2 | SST | 45 | 2 | 100 | 0.6 | 5.2 | 5.2 |
| 61658 | 44.3 | 28.7 | SST | 186 | 50 | 100 | 4.8 | 0.7 | 4.9 |
| 61659 | 44.3 | 35.8 | SST | 111 | 47 | 100 | 3.3 | 3.7 | 5.0 |
| 64560 | 60.5 | -29.4 | SST | 407 | 0 | 51 | 3.8 | 4.0 | 5.5 |

Figure 2. DRIFTER mean daily count. MAY 2002

Main hours only

Global average number of observations in 24 hours = 10730


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
19 17 3 60 91 9 45 15 1 7 8 11 14 2 0 2 12 7 61
7 68 5 38 11 0 0 5 21 7 17 0 0 28 0 20
0 0 12 7 106 59 4 8 0 0 0
18 16 18 0 4 0 0 29 110 219 154 0 1 0 0 0 0 0 0
4 56 103 13 56 0 25 18 55 80 57 64 45 31 0 39 224 45 0 0 95 4 4 4
0 0 5 23 3 4 48 119 30 16 21 45 18 54 8 23 9 143 16 25 1
14 5 25 23 35 47 79 64 59 50 95 62 14 10 4 34 0 21 35 34 9 18 15
12 13 10 42 15 18 21 17 5 10 19 42 57 37 18 28 0 81 113 324 199 7 34 28 35 19 12 9
1 6 18 28 34 17 11 18 17 10 12 5 26 10 5 14 5 16 17 93 11 27 22 17 0 3 0 6
6 67 42 17 2 5 17 7 10 0 6 4 1 22 15 3 5 3 6 51 16 9 9 14 31
45 62 32 6 10 41 30 36 44 7 7 22 23 7 12 29 70 90 49 8 1 35 1 16 0 3
10 87 6 22 96 76 17 6 11 8 11 30 34 0 4 44 4 40 74 1 36 27 31 7
8 77 94 10 25 46 51 10 26 16 76 23 10 3 28 51 41 30 46 20 96 120 38 6 8 32 8 52 22
36 137 81 37 1 13 20 29 29 40 27 38 16 14 28 86 65 45 286 38 59 105 40 16 70 4 36 80 29 78 10 4
26 39 47 17 15 11 34 45 13 55 87 79 40 32 2 27 35 16 23 9
47 22 20 14 26 7 1 15 63 3 0 0 0 19
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

## TABLE 3

## MONITORING OF LAND SURFACE OBSERVATIONS
## MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for synops & autosynops. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00, 06, 12, 18 UTC |
| **Elements monitored** | | :Surface pressure (hPa). |
| **Parameters monitored** | :HT(m) | :Station height (in metres) as given in WMO No. 9 Vol A |
| | :RP | :Pressure reporting practice<br>M=mean sea level pressure (hPa) reported.<br>S=Station level pressure reported.<br>8=Geopotential height (m) of 850 hPa surface reported.<br>7=Geopotential height (m) of 700 hPa surface reported. |
| | :NOBS | :Number of observations received excluding duplicates. |
| | :NGE | :Number of observations with gross errors. |
| | :PGE | :Percentage of observations with gross errors. |
| | :%REJ | :Percentage of observations flagged excluding those with gross errors. |
| | :SD | :SD of difference of observations from background values excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors. |
| **GROSS ERROR LIMIT** | :15 hPa | (pressure) |
| **SELECTION CRITERIA** | :NOBS | ≥ 20 ,and one or more of the following: |
| | 1.\|bias\| | ≥ 4 hPa |
| | 2. SD | ≥ 6 hPa |
| | 3.PGE | ≥ 25. |

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

### WMO REGION 1:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60437 | 36.3N | 2.8E | 981 | S8 | 71 | 0 | 0 | 0 | 0.8 | -6.9 | 6.9 |
| 60476 | 35.4N | 7.2E | 1116 | S8 | 73 | 4 | 5 | 0 | 1.8 | 13.1 | 13.2 |
| 60728 | 36.4N | 10.7E | 1 | MS | 45 | 0 | 0 | 2 | 1.3 | -8.4 | 8.5 |
| 61492 | 16.1N | 13.5W | 18 | MS | 68 | 1 | 1 | 0 | 2.0 | 5.2 | 5.6 |
| 62790 | 12.1N | 24.9E | 674 | MS | 58 | 2 | 3 | 2 | 1.6 | 4.4 | 4.7 |
| 63330 | 13.5N | 39.5E | 2070 | MS | 29 | 28 | 97 | 0 | 0.0 | 12.5 | 12.5 |
| 63333 | 11.1N | 39.7E | 1903 | MS | 31 | 0 | 0 | 3 | 1.6 | 4.6 | 4.9 |
| 63334 | 10.3N | 37.7E | 2515 | MS | 31 | 0 | 0 | 0 | 0.8 | 10.8 | 10.8 |
| 63402 | 7.7N | 36.8E | 1725 | MS | 30 | 1 | 3 | 0 | 1.0 | 8.0 | 8.1 |
| 63450 | 9.0N | 38.8E | 2354 | MS | 29 | 0 | 0 | 0 | 0.8 | 4.2 | 4.3 |
| 63453 | 8.9N | 39.9E | 930 | S | 31 | 0 | 0 | 0 | 0.8 | -4.5 | 4.6 |
| 63471 | 9.6N | 41.9E | 1260 | MS | 31 | 0 | 0 | 0 | 0.6 | 9.7 | 9.7 |
| 63478 | 5.9N | 43.6E | 295 | MS | 29 | 0 | 0 | 0 | 0.7 | 6.0 | 6.0 |
| 63801 | 4.9S | 29.6E | 882 | S8 | 53 | 3 | 6 | 0 | 0.7 | 8.3 | 8.3 |
| 65355 | 9.8N | 1.1E | 342 | MS | 107 | 1 | 1 | 2 | 2.0 | -11.1 | 11.3 |
| 65401 | 10.9N | 1.1W | 201 | M | 32 | 0 | 0 | 3 | 1.3 | 4.3 | 4.5 |
| 67308 | 22.1S | 31.7E | 452 | M | 24 | 24 | 100 | 0 | | | |
| 68030 | 18.5S | 25.6E | 1071 | 8 | 81 | 0 | 0 | 1 | 0.8 | 4.0 | 4.1 |
| 68338 | 26.9S | 24.6E | 1234 | S8 | 60 | 60 | 100 | 0 | | | |
| 68396 | 26.5S | 31.3E | 641 | S8 | 56 | 0 | 0 | 2 | 1.6 | 4.8 | 5.1 |
| 68558 | 30.9S | 27.6E | 1816 | S8 | 62 | 41 | 66 | 10 | 0.6 | 0.3 | 0.7 |
| 68575 | 30.0S | 30.0E | 1175 | S8 | 116 | 116 | 100 | 0 | | | |
| 68754 | 32.5S | 27.5E | 899 | S8 | 80 | 55 | 69 | 3 | 0.8 | -0.5 | 0.9 |

### WMO REGION 2:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23975 | 60.4N | 88.4E | 86 | 7 | 119 | 119 | 100 | 0 | | | |
| 30554 | 54.5N | 113.6E | 995 | MS | 120 | 1 | 1 | 0 | 5.2 | 4.6 | 6.9 |
| 30967 | 49.9N | 115.8E | 623 | MS | 89 | 1 | 1 | 2 | 1.9 | -5.7 | 6.0 |
| 38744 | 39.3N | 73.3E | 4267 | S8 | 44 | 27 | 61 | 0 | 1.4 | -1.1 | 1.8 |
| 40713 | 37.4N | 46.3E | 1475 | MS | 84 | 2 | 2 | 61 | 0.7 | 12.8 | 12.8 |
| 40726 | 36.8N | 45.7E | 1384 | MS | 93 | 0 | 0 | 0 | 0.9 | 4.0 | 4.1 |
| 41254 | 23.1N | 57.7E | 1755 | S8 | 75 | 75 | 100 | 0 | | | |
| 41396 | 16.0N | 48.9E | 700 | MS | 27 | 0 | 0 | 0 | 0.7 | 6.1 | 6.1 |
| 41466 | 13.7N | 44.1E | 1402 | 8 | 28 | 0 | 0 | 0 | 0.8 | -5.8 | 5.9 |
| 43415 | 8.8N | 80.5E | 98 | S | 57 | 57 | 100 | 68 | | | |
| 44416 | 28.6N | 81.6E | 720 | MS | 36 | 0 | 0 | 3 | 2.1 | 4.2 | 4.7 |
| 47022 | 40.8N | 128.2E | 1200 | S | 79 | 0 | 0 | 3 | 1.6 | 4.9 | 5.2 |
| 47127 | 36.9N | 127.0E | 16 | MS | 120 | 0 | 0 | 0 | 0.9 | -11.6 | 11.6 |
| 51495 | 43.5N | 91.6E | 874 | M | 99 | 0 | 0 | 0 | 1.3 | 5.2 | 5.4 |
| 52602 | 38.8N | 93.4E | 2734 | S | 120 | 0 | 0 | 0 | 1.2 | -7.0 | 7.1 |
| 52866 | 36.6N | 101.8E | 2262 | S | 120 | 0 | 0 | 0 | 1.2 | -4.7 | 4.9 |
| 52955 | 35.6N | 100.8E | 3201 | S | 120 | 0 | 0 | 0 | 1.0 | 11.7 | 11.7 |
| 56144 | 31.8N | 98.6E | 3184 | S | 120 | 0 | 0 | 0 | 1.2 | -5.1 | 5.2 |
| 56146 | 31.6N | 100.0E | 339 | S | 119 | 119 | 100 | 0 | | | |
| 56444 | 28.5N | 98.9E | 3488 | S | 119 | 77 | 65 | 41 | 0.6 | 13.3 | 13.3 |
| 56462 | 29.0N | 101.5E | 2994 | S | 120 | 0 | 0 | 0 | 1.4 | 8.4 | 8.5 |

### WMO REGION 3:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 80099 | 7.1N | 70.7W | 128 | MS | 35 | 0 | 0 | 0 | 1.3 | -5.1 | 5.3 |
| 80342 | 1.4N | 77.3W | 1796 | S | 47 | 1 | 2 | 0 | 0.8 | 4.2 | 4.3 |
| 82181 | 2.0S | 54.1W | 146 | MS | 84 | 0 | 0 | 0 | 1.0 | 4.5 | 4.6 |
| 82353 | 3.2S | 52.2W | 74 | MS | 83 | 0 | 0 | 0 | 0.9 | -4.4 | 4.5 |
| 83214 | 10.3S | 54.9W | 285 | MS | 88 | 0 | 0 | 0 | 4.8 | -4.4 | 6.5 |

### WMO REGION 3:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 83235 | 12.4S | 46.4W | 604 | MS | 88 | 0 | 0 | 0 | 0.6 | 6.1 | 6.1 |
| 83332 | 14.1S | 46.4W | 826 | MS | 87 | 9 | 10 | 0 | 0.8 | 13.7 | 13.7 |
| 83531 | 18.6S | 46.5W | 940 | MS | 88 | 0 | 0 | 0 | 0.8 | -7.1 | 7.1 |
| 83836 | 25.5S | 50.6W | 837 | MS | 89 | 1 | 1 | 0 | 0.8 | -5.1 | 5.2 |
| 84377 | 3.8S | 73.3W | 125 | MS | 97 | 0 | 0 | 0 | 1.2 | 4.7 | 4.9 |
| 84425 | 5.9S | 76.1W | 179 | MS | 53 | 0 | 0 | 0 | 1.4 | 4.9 | 5.1 |
| 84455 | 6.5S | 76.4W | 281 | MS | 69 | 0 | 0 | 1 | 1.3 | 7.5 | 7.6 |
| 84472 | 7.1S | 78.5W | 2620 | S | 52 | 0 | 0 | 0 | 0.6 | -5.5 | 5.5 |
| 84474 | 7.2S | 76.7W | 350 | S | 23 | 0 | 0 | 0 | 1.3 | 10.7 | 10.8 |
| 84686 | 13.6S | 72.0W | 3248 | S | 107 | 0 | 0 | 0 | 0.9 | -4.0 | 4.1 |
| 84688 | 13.7S | 73.4W | 3444 | S | 47 | 1 | 2 | 2 | 0.5 | -12.6 | 12.6 |
| 84720 | 14.9S | 75.0W | 567 | MS | 52 | 0 | 0 | 0 | 0.8 | 5.4 | 5.5 |
| 84782 | 18.1S | 70.3W | 468 | MS | 85 | 1 | 1 | 2 | 1.5 | 7.8 | 7.9 |
| 85140 | 14.3S | 67.4W | 140 | MS | 42 | 0 | 0 | 0 | 1.7 | 5.3 | 5.6 |
| 85141 | 14.5S | 67.6W | 204 | MS | 57 | 0 | 0 | 4 | 1.9 | 4.1 | 4.5 |
| 85264 | 18.5S | 64.1W | 1998 | S | 57 | 57 | 100 | 0 |  |  |  |
| 85312 | 19.8S | 63.9W | 992 | S | 46 | 2 | 4 | 0 | 1.3 | -10.7 | 10.8 |
| 85394 | 22.8S | 64.3W | 381 | MS | 41 | 1 | 2 | 0 | 3.8 | 5.4 | 6.6 |
| 85406 | 18.3S | 70.3W | 55 | M | 117 | 0 | 0 | 0 | 1.0 | 4.3 | 4.4 |
| 85432 | 22.5S | 68.9W | 2320 | S8 | 82 | 0 | 0 | 0 | 0.7 | 5.7 | 5.7 |
| 88986 | 59.4S | 27.3W | 78 | MS | 457 | 346 | 76 | 0 | 1.2 | 0.5 | 1.3 |

### WMO REGION 4:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 71023 | 65.9N | 89.5W | 18 | MS | 120 | 120 | 100 | 0 |  |  |  |
| 71599 | 44.4N | 65.2W | 127 | MS | 117 | 0 | 0 | 61 | 0.7 | -4.2 | 4.3 |
| 71747 | 48.8N | 91.6W | 424 | MS | 120 | 0 | 0 | 0 | 0.8 | 4.0 | 4.1 |
| 72327 | 36.1N | 86.7W | 182 | MS | 117 | 0 | 0 | 0 | 0.7 | 4.1 | 4.2 |
| 76118 | 30.4N | 109.7W | 1040 | MS | 34 | 1 | 3 | 0 | 0.6 | -10.8 | 10.8 |
| 76243 | 28.7N | 100.5W | 250 | MS | 91 | 0 | 0 | 0 | 1.0 | 5.6 | 5.7 |
| 76625 | 20.6N | 100.4W | 1813 | MS | 50 | 0 | 0 | 0 | 0.6 | -9.9 | 9.9 |
| 76640 | 20.9N | 97.4W | 28 | MS | 106 | 0 | 0 | 0 | 0.8 | 4.4 | 4.5 |
| 76658 | 19.2N | 103.7W | 494 | MS | 35 | 0 | 0 | 0 | 0.7 | 5.5 | 5.5 |
| 76743 | 18.0N | 92.9W | 10 | MS | 84 | 0 | 0 | 0 | 0.7 | 6.6 | 6.6 |
| 76903 | 14.9N | 92.3W | 118 | MS | 110 | 0 | 0 | 0 | 0.7 | 6.6 | 6.6 |

### WMO REGION 5:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 92010 | 6.1S | 145.4E | 1587 | M | 48 | 0 | 0 | 0 | 1.1 | 10.3 | 10.4 |
| 94322 | 20.2S | 130.0E | 340 | MS | 115 | 115 | 100 | 0 |  |  |  |
| 94368 | 20.3S | 149.0E | 2 | MS | 117 | 0 | 0 | 64 | 0.5 | -4.7 | 4.7 |
| 95815 | 35.1S | 144.0E | 72 | MS | 120 | 0 | 0 | 0 | 2.2 | 5.3 | 5.7 |
| 96505 | 3.7N | 115.7E | 944 | S8 | 43 | 43 | 100 | 0 |  |  |  |
| 97378 | 10.7S | 123.1E | 1 | MS | 47 | 47 | 100 | 0 |  |  |  |

### WMO REGION 6:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 06685 | 47.0N | 9.1E | 515 | MS | 118 | 0 | 0 | 8 | 1.5 | 5.8 | 6.0 |
| 10557 | 50.5N | 11.1E | 845 | S8 | 360 | 360 | 100 | 0 |  |  |  |
| 12140 | 54.4N | 18.7E | 2 | MS | 119 | 1 | 1 | 2 | 1.0 | 8.1 | 8.2 |
| 13269 | 44.3N | 19.9E | 176 | MS | 119 | 0 | 0 | 0 | 0.8 | 7.6 | 7.6 |
| 14554 | 44.9N | 18.4E | 140 | S | 56 | 2 | 4 | 0 | 0.8 | -12.9 | 12.9 |

WMO REGION 6:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14650 | 43.8N | 18.0E | 972 | S | 60 | 0 | 0 | 0 | 1.0 | 4.7 | 4.8 |
| 15140 | 46.5N | 22.4E | 500 | S8 | 24 | 24 | 100 | 0 | | | |
| 15284 | 45.6N | 26.4E | 1632 | S8 | 41 | 2 | 5 | 0 | 2.1 | 4.0 | 4.5 |
| 16470 | 36.8N | 12.0E | 191 | MS | 99 | 0 | 0 | 0 | 0.8 | -4.1 | 4.2 |
| 17092 | 39.8N | 39.5E | 1218 | S8 | 120 | 0 | 0 | 3 | 1.4 | 8.0 | 8.1 |
| 17203 | 38.9N | 40.5E | 1177 | S8 | 110 | 0 | 0 | 0 | 1.0 | 7.9 | 8.0 |

ANTARCTIC:

| STATION | LAT | LONG | HT(M) | RP | NOBS | NGE | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 89004 | 71.7S | 2.8W | 815 | MS | 103 | 0 | 0 | 0 | 1.7 | -6.7 | 6.9 |
| 89208 | 90.0S | 0.0W | 2835 | M | 26 | 26 | 100 | 0 | | | |
| 89263 | 66.0S | 66.1W | 20 | M | 196 | 0 | 0 | 1 | 1.9 | 8.7 | 8.9 |
| 89264 | 71.4S | 68.9W | 780 | S | 253 | 0 | 0 | 0 | 1.1 | 7.1 | 7.2 |
| 89266 | 72.2S | 60.3W | 91 | S | 254 | 185 | 73 | 0 | 1.8 | -11.9 | 12.0 |
| 89272 | 74.8S | 71.5W | 1369 | S | 245 | 245 | 100 | 0 | | | |
| 89512 | 70.8S | 11.8E | 140 | MS | 116 | 1 | 1 | 0 | 1.8 | -4.6 | 4.9 |
| 89572 | 68.9S | 78.0E | 363 | S | 22 | 22 | 100 | 18 | | | |
| 89637 | 69.9S | 130.0E | 2560 | S | 113 | 13 | 12 | 0 | 0.8 | 13.6 | 13.6 |
| 89744 | 74.0S | 43.0E | 3353 | S | 264 | 0 | 0 | 0 | 0.8 | 7.3 | 7.3 |
| 89769 | 78.5S | 168.4E | 50 | S | 380 | 380 | 100 | 0 | | | |
| 89847 | 67.6S | 146.0E | 30 | S | 299 | 10 | 3 | 0 | 2.0 | -8.4 | 8.6 |

# TABLE 4A

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Statistics for each airline carrier. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :All hours combined. |
| **Level(s) monitored** | | :300.0 - 150.0 hPa |
| **Elements monitored** | | :TEMP in °C ; WIND in m $s^{-1}$ |
| **Parameters monitored** | :N REP. | :Number of observations received excluding duplicates. |
| | :PG | :Percentage of observations with gross errors. |
| | :PR | :Percentage of observations rejected by quality control including rejections from the duplicate check. |
| | :PC | :Percentage of observations with calm winds. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed. |
| **GROSS ERROR LIMITS** | | :10.0 °C ; 60 m $s^{-1}$ Vector Wind |
| **SELECTION CRITERIA** | | :N REP ≥ 20 |

**NB :** All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

| | TEMPERATURE | | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAH | 1825 | 0 | 41 | 1.2 | 0.2 | 1811 | 0 | 41 | 0 | 6.0 | 0.6 |
| AAL | 6564 | 1 | 31 | 1.3 | 0.2 | 6340 | 0 | 31 | 0 | 6.3 | 0.4 |
| AAR | 1443 | 0 | 6 | 1.8 | -0.1 | 1452 | 0 | 5 | 0 | 7.3 | 0.1 |
| ACA | 3534 | 0 | 7 | 1.6 | -0.1 | 3204 | 0 | 8 | 0 | 7.1 | 0.5 |
| ACI | 59 | 0 | 47 | 1.0 | 0.3 | 59 | 3 | 49 | 0 | 6.3 | 1.2 |
| AEA | 1019 | 1 | 3 | 1.5 | 0.7 | 555 | 0 | 4 | 0 | 6.9 | 0.4 |
| AEL | 537 | 1 | 9 | 1.6 | -0.5 | 445 | 0 | 11 | 0 | 7.7 | 0.5 |
| AFL | 602 | 1 | 2 | 1.8 | 0.6 | 515 | 0 | 4 | 0 | 6.9 | 0.7 |
| AFR | 1793 | 0 | 7 | 1.8 | 0.5 | 1369 | 0 | 8 | 0 | 6.9 | 0.8 |
| AIS | 156 | 0 | 6 | 1.6 | 0.4 | 141 | 1 | 8 | 0 | 8.6 | 0.7 |
| AJM | 409 | 1 | 3 | 1.4 | -0.2 | 340 | 0 | 4 | 0 | 7.9 | 0.8 |
| AJX | 281 | 0 | 6 | 1.8 | 1.2 | 277 | 0 | 5 | 0 | 7.3 | 1.2 |
| AMM | 106 | 3 | 14 | 1.5 | 0.2 | 91 | 0 | 11 | 0 | 10.1 | 1.5 |
| AMT | 829 | 1 | 40 | 1.1 | 0.3 | 834 | 0 | 41 | 0 | 6.5 | 0.3 |
| AMX | 365 | 2 | 6 | 2.0 | 0.0 | 252 | 0 | 4 | 0 | 9.4 | 0.5 |
| ANA | 437 | 0 | 6 | 1.5 | 0.6 | 433 | 1 | 6 | 0 | 6.5 | 0.6 |
| ANZ | 4640 | 0 | 35 | 1.5 | 0.4 | 4602 | 0 | 35 | 0 | 6.5 | 0.6 |
| ARG | 36 | 6 | 28 | 2.4 | 0.3 | 28 | 0 | 25 | 0 | 8.1 | 1.4 |
| AVA | 283 | 0 | 4 | 1.7 | 0.7 | 158 | 0 | 4 | 0 | 7.1 | 0.6 |
| AVE | 119 | 3 | 12 | 2.8 | 1.3 | 62 | 0 | 2 | 0 | 5.8 | 1.4 |
| AVN | 140 | 0 | 49 | 1.2 | 0.1 | 140 | 0 | 50 | 0 | 8.1 | -0.7 |
| AZA | 534 | 1 | 6 | 1.9 | 0.3 | 434 | 0 | 5 | 0 | 7.9 | 0.7 |
| BAL | 183 | 0 | 5 | 1.0 | 0.1 | 169 | 0 | 7 | 0 | 5.8 | 0.9 |
| BAW | 861 | 0 | 9 | 1.8 | -0.2 | 814 | 1 | 10 | 0 | 6.9 | 0.9 |
| BSK | 47 | 11 | 36 | 1.4 | 0.6 | 49 | 0 | 33 | 0 | 7.1 | -0.1 |
| BWA | 332 | 1 | 5 | 1.9 | 1.3 | 230 | 0 | 6 | 0 | 8.7 | 0.8 |
| CAL | 108 | 1 | 7 | 1.9 | 0.0 | 112 | 0 | 8 | 0 | 8.8 | 0.3 |
| CCA | 250 | 2 | 14 | 2.5 | 0.3 | 282 | 1 | 100 | 0 | 11.9 | -0.7 |
| CES | 392 | 0 | 4 | 1.4 | 0.4 | 396 | 1 | 9 | 0 | 10.3 | -0.2 |
| CFC | 60 | 0 | 5 | 2.1 | 0.5 | 62 | 0 | 5 | 0 | 7.0 | 2.6 |
| CFG | 874 | 0 | 4 | 1.6 | -0.6 | 761 | 0 | 5 | 0 | 7.7 | 0.4 |
| CGB | 29 | 0 | 0 | 1.6 | -0.6 | 28 | 0 | 4 | 0 | 7.1 | 1.9 |
| CKS | 325 | 0 | 35 | 2.6 | 2.2 | 326 | 0 | 34 | 0 | 5.7 | 0.8 |
| CLX | 479 | 0 | 4 | 1.6 | -0.3 | 390 | 0 | 5 | 0 | 7.1 | 0.4 |
| CMI | 50 | 0 | 10 | 1.7 | 0.6 | 50 | 0 | 10 | 0 | 9.8 | -0.3 |
| COA | 1022 | 0 | 39 | 1.2 | -0.2 | 977 | 0 | 40 | 0 | 7.1 | 0.4 |
| CRL | 701 | 1 | 7 | 1.6 | 0.3 | 514 | 1 | 8 | 0 | 7.5 | 0.5 |
| CSN | 92 | 0 | 8 | 1.8 | 0.0 | 92 | 0 | 11 | 0 | 10.4 | 0.5 |
| CUB | 340 | 1 | 5 | 2.0 | 0.8 | 260 | 0 | 7 | 0 | 9.8 | 0.5 |
| DAF | 28 | 0 | 0 | 0.9 | 0.1 | 24 | 0 | 0 | 0 | 3.7 | 0.6 |
| DAL | 3159 | 0 | 39 | 1.2 | -0.1 | 3067 | 0 | 41 | 0 | 7.0 | 0.3 |
| DBR | 56 | 0 | 5 | 1.9 | -0.3 | 56 | 0 | 7 | 0 | 9.0 | 1.2 |
| DCE | 168 | 1 | 7 | 1.6 | 0.2 | 142 | 0 | 8 | 0 | 6.7 | 0.7 |
| DLH | 1408 | 1 | 11 | 1.4 | 0.1 | 1274 | 0 | 11 | 0 | 6.6 | 1.0 |
| EDW | 75 | 1 | 5 | 1.7 | 0.0 | 67 | 0 | 4 | 0 | 6.6 | 1.2 |
| EIA | 256 | 0 | 11 | 1.7 | 0.5 | 245 | 0 | 100 | 0 | 16.2 | 4.5 |
| ELY | 108 | 1 | 1 | 1.3 | 0.0 | 106 | 0 | 4 | 0 | 6.8 | 1.3 |
| ETH | 34 | 0 | 15 | 1.1 | 0.0 | 34 | 0 | 18 | 0 | 10.4 | -1.2 |
| EVA | 120 | 0 | 13 | 1.6 | 0.0 | 127 | 1 | 13 | 0 | 8.9 | -0.3 |
| EWW | 99 | 0 | 5 | 1.7 | 0.0 | 100 | 1 | 7 | 0 | 7.7 | 1.7 |
| FDX | 2232 | 1 | 39 | 1.4 | 0.3 | 2224 | 0 | 39 | 0 | 6.9 | 0.7 |
| FIN | 270 | 0 | 4 | 1.6 | 0.3 | 252 | 0 | 5 | 0 | 6.7 | 0.4 |
| FJI | 937 | 1 | 48 | 1.4 | 0.6 | 907 | 1 | 49 | 0 | 8.5 | 0.3 |
| FOM | 679 | 0 | 31 | 1.2 | 0.1 | 674 | 0 | 32 | 0 | 7.3 | 0.2 |
| GAF | 64 | 0 | 2 | 1.6 | -0.7 | 64 | 0 | 3 | 0 | 6.2 | 1.3 |
| GCO | 284 | 1 | 16 | 1.4 | 0.3 | 287 | 1 | 100 | 0 | 12.2 | 2.5 |
| GHA | 47 | 0 | 11 | 1.5 | -0.1 | 34 | 0 | 9 | 0 | 7.8 | 1.8 |
| GTI | 145 | 1 | 6 | 2.0 | 0.1 | 151 | 0 | 5 | 0 | 7.8 | 0.6 |
| HAL | 3883 | 0 | 36 | 1.3 | 0.1 | 3457 | 0 | 36 | 0 | 8.0 | 0.9 |

|  |  |  | TEMPERATURE |  |  |  |  | WIND |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| IBE | 3341 | 1 | 6 | 1.5 | 0.5 | 2076 | 0 | 9 | 0 | 7.8 | 0.4 |
| ICE | 983 | 0 | 4 | 1.5 | -0.1 | 917 | 0 | 4 | 0 | 7.0 | 0.8 |
| IWD | 146 | 1 | 2 | 1.2 | -0.4 | 94 | 0 | 0 | 0 | 5.3 | 0.8 |
| JAA | 86 | 2 | 17 | 2.6 | 1.9 | 86 | 0 | 16 | 0 | 7.8 | 2.3 |
| JAL | 2680 | 0 | 4 | 1.6 | 0.4 | 2641 | 0 | 5 | 0 | 7.5 | 0.4 |
| JAZ | 1139 | 1 | 6 | 1.8 | 1.2 | 1130 | 0 | 6 | 0 | 7.0 | 0.2 |
| JMC | 124 | 0 | 4 | 1.4 | 0.2 | 98 | 0 | 5 | 0 | 6.0 | 1.6 |
| KAL | 3035 | 0 | 7 | 1.7 | 0.1 | 3033 | 0 | 8 | 0 | 8.1 | 0.4 |
| KIW | 27 | 0 | 37 | 2.5 | 1.3 | 27 | 7 | 37 | 0 | 6.3 | 0.4 |
| KLM | 2232 | 0 | 2 | 1.6 | 0.4 | 1790 | 0 | 3 | 0 | 6.5 | 0.7 |
| LAN | 119 | 3 | 18 | 2.6 | 0.8 | 110 | 0 | 15 | 0 | 9.6 | 0.8 |
| LAP | 76 | 3 | 42 | 2.1 | 0.9 | 71 | 0 | 45 | 0 | 12.4 | 1.1 |
| LDA | 38 | 0 | 8 | 1.1 | 0.4 | 35 | 0 | 11 | 0 | 6.6 | 0.3 |
| LDI | 549 | 0 | 3 | 1.6 | 0.0 | 403 | 0 | 3 | 0 | 6.3 | 0.6 |
| LIB | 670 | 1 | 6 | 1.5 | 0.9 | 457 | 0 | 6 | 0 | 6.5 | 0.9 |
| LOT | 184 | 1 | 7 | 1.9 | -0.9 | 176 | 0 | 7 | 0 | 7.6 | 0.9 |
| LTU | 810 | 1 | 5 | 1.5 | -0.1 | 668 | 0 | 5 | 0 | 7.6 | 1.1 |
| LXP | 26 | 0 | 35 | 3.7 | 0.8 | 26 | 4 | 42 | 0 | 20.5 | 3.3 |
| MAS | 281 | 0 | 3 | 1.5 | 0.1 | 281 | 0 | 4 | 0 | 7.9 | -0.2 |
| MON | 99 | 3 | 9 | 1.6 | 0.2 | 72 | 0 | 8 | 0 | 9.1 | 1.0 |
| MPD | 357 | 2 | 5 | 1.1 | -0.3 | 245 | 0 | 6 | 0 | 6.4 | 1.1 |
| MPH | 725 | 0 | 3 | 1.6 | -0.6 | 633 | 0 | 3 | 0 | 6.3 | 0.4 |
| MYT | 393 | 1 | 5 | 1.6 | 0.0 | 330 | 0 | 5 | 0 | 7.0 | 0.4 |
| NCA | 929 | 1 | 3 | 1.6 | 0.4 | 719 | 0 | 4 | 0 | 7.7 | 0.0 |
| NGA | 49 | 2 | 14 | 3.1 | 2.2 | 40 | 0 | 15 | 0 | 8.1 | 1.3 |
| NWA | 9789 | 0 | 9 | 1.6 | 0.5 | 9688 | 0 | 9 | 0 | 7.5 | 0.3 |
| NZL | 3442 | 0 | 12 | 1.3 | 0.3 | 3442 | 0 | 12 | 0 | 5.5 | 0.8 |
| OAE | 186 | 0 | 41 | 0.9 | -0.1 | 184 | 0 | 42 | 0 | 6.1 | 0.5 |
| PAC | 438 | 0 | 25 | 1.7 | -0.1 | 435 | 1 | 26 | 0 | 8.7 | -0.1 |
| PAL | 1398 | 0 | 12 | 1.4 | -0.2 | 1333 | 0 | 13 | 0 | 7.7 | 0.3 |
| PAO | 354 | 2 | 57 | 1.8 | 0.2 | 341 | 0 | 56 | 0 | 10.4 | 0.4 |
| PUA | 43 | 0 | 30 | 3.9 | 2.2 | 33 | 3 | 39 | 0 | 15.9 | 4.3 |
| QFA | 3163 | 1 | 46 | 1.5 | 0.3 | 3155 | 0 | 46 | 0 | 6.1 | 0.2 |
| RAF | 26 | 0 | 0 | 2.2 | 1.9 | 26 | 0 | 0 | 0 | 6.5 | 0.6 |
| RAM | 191 | 2 | 7 | 1.8 | 0.3 | 97 | 0 | 5 | 0 | 9.4 | 1.1 |
| RCH | 567 | 1 | 100 | 3.1 | -0.5 | 516 | 0 | 100 | 0 | 11.7 | 2.2 |
| RJA | 30 | 0 | 7 | 2.0 | 0.0 | 30 | 3 | 10 | 0 | 9.1 | -0.2 |
| RON | 38 | 0 | 45 | 0.8 | 0.2 | 40 | 5 | 50 | 0 | 11.0 | -2.0 |
| RRR | 118 | 1 | 12 | 1.9 | -0.2 | 111 | 0 | 19 | 0 | 9.0 | 1.8 |
| RYN | 285 | 0 | 42 | 1.0 | 0.6 | 284 | 0 | 42 | 0 | 5.3 | 0.2 |
| RZO | 330 | 0 | 100 | 2.4 | 0.6 | 170 | 1 | 5 | 0 | 7.9 | 0.6 |
| SAA | 377 | 0 | 2 | 1.3 | -0.5 | 321 | 0 | 3 | 0 | 8.4 | 1.0 |
| SAS | 27 | 0 | 0 | 1.0 | -0.2 | 21 | 0 | 5 | 0 | 10.4 | -0.8 |
| SIA | 307 | 0 | 3 | 1.4 | 0.2 | 315 | 0 | 3 | 0 | 6.0 | 0.2 |
| SLR | 270 | 0 | 10 | 1.1 | 0.3 | 243 | 0 | 12 | 0 | 7.5 | 0.3 |
| SQC | 33 | 0 | 0 | 1.4 | 0.6 | 35 | 0 | 0 | 0 | 5.9 | -0.5 |
| SSV | 24 | 0 | 0 | 1.0 | -0.2 | 22 | 0 | 0 | 0 | 4.2 | 1.5 |
| TAG | 31 | 0 | 19 | 2.0 | 0.6 | 30 | 0 | 20 | 0 | 9.1 | -0.7 |
| TAM | 37 | 0 | 22 | 1.9 | 1.0 | 37 | 3 | 27 | 0 | 15.0 | 4.4 |
| TAP | 710 | 1 | 3 | 1.4 | -0.2 | 258 | 0 | 5 | 0 | 8.5 | 1.2 |
| THA | 151 | 0 | 1 | 1.3 | -0.2 | 154 | 0 | 3 | 0 | 5.5 | 0.9 |
| THT | 146 | 1 | 25 | 1.9 | 0.6 | 134 | 1 | 25 | 0 | 8.1 | 0.4 |
| TPA | 34 | 0 | 3 | 1.0 | 0.3 | 33 | 0 | 9 | 0 | 9.2 | 0.1 |
| TSC | 204 | 0 | 3 | 1.6 | -0.4 | 184 | 0 | 5 | 0 | 7.0 | 1.4 |
| UAL | 145444 | 0 | 97 | 1.0 | 0.0 | 145170 | 0 | 97 | 0 | 5.1 | 0.5 |
| UPS | 2129 | 1 | 53 | 1.8 | 0.5 | 2092 | 0 | 52 | 0 | 6.4 | 0.5 |
| USA | 167 | 0 | 2 | 1.3 | 0.0 | 141 | 1 | 9 | 0 | 10.4 | -0.3 |
| VIR | 362 | 1 | 4 | 1.4 | 0.1 | 337 | 0 | 4 | 0 | 7.7 | 0.7 |
| VPB | 26 | 0 | 15 | 2.0 | -0.3 | 27 | 0 | 15 | 0 | 5.5 | 0.7 |

|  | TEMPERATURE |  |  |  |  | WIND |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| VRG | 199 | 5 | 55 | 2.5 | 0.8 | 183 | 2 | 100 | 0 | 11.8 | 1.5 |
| VVJ | 35 | 9 | 43 | 2.3 | -2.0 | 37 | 0 | 35 | 0 | 6.0 | -0.3 |
| WOA | 257 | 0 | 3 | 1.3 | 0.3 | 262 | 0 | 8 | 0 | 8.8 | 1.0 |
| YSS | 48 | 0 | 13 | 1.8 | 0.9 | 29 | 0 | 14 | 0 | 8.5 | 1.3 |
| AR | 985 | 0 | 100 | 3.1 | 2.9 | 984 | 0 | 5 | 0 | 6.2 | 0.9 |
| AU | 37732 | 0 | 11 | 1.3 | 0.6 | 37739 | 0 | 11 | 0 | 5.3 | 0.5 |
| EU | 109489 | 0 | 33 | 1.2 | 0.2 | 109489 | 0 | 31 | 0 | 4.7 | 0.5 |
| KL | 1028 | 0 | 11 | 1.3 | 0.7 | 1020 | 0 | 11 | 0 | 5.1 | 1.0 |
| LH | 1797 | 0 | 10 | 1.6 | 1.1 | 1789 | 0 | 10 | 0 | 4.9 | 0.7 |
| MK | 4737 | 0 | 7 | 1.7 | 1.2 | 4708 | 1 | 8 | 0 | 7.9 | 1.5 |
| SA | 6971 | 0 | 63 | 1.9 | 1.4 | 6966 | 0 | 10 | 0 | 6.4 | 0.8 |
| TN | 35 | 0 | 3 | 2.6 | 2.1 | 35 | 0 | 0 | 0 | 8.4 | 0.6 |
| WA | 400 | 2 | 11 | 1.5 | 0.5 | 400 | 2 | 12 | 0 | 6.4 | 0.9 |
| XX | 3500 | 1 | 9 | 1.2 | 0.3 | 3479 | 0 | 10 | 0 | 8.2 | 1.4 |
| N | 573 | 2 | 18 | 2.1 | 0.5 | 563 | 0 | 17 | 0 | 7.8 | 0.9 |
| US ACARS | 983240 | 1 | 58 | 1.3 | 0.5 | 983233 | 0 | 58 | 0 | 5.4 | 0.8 |

## TABLE 4B

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

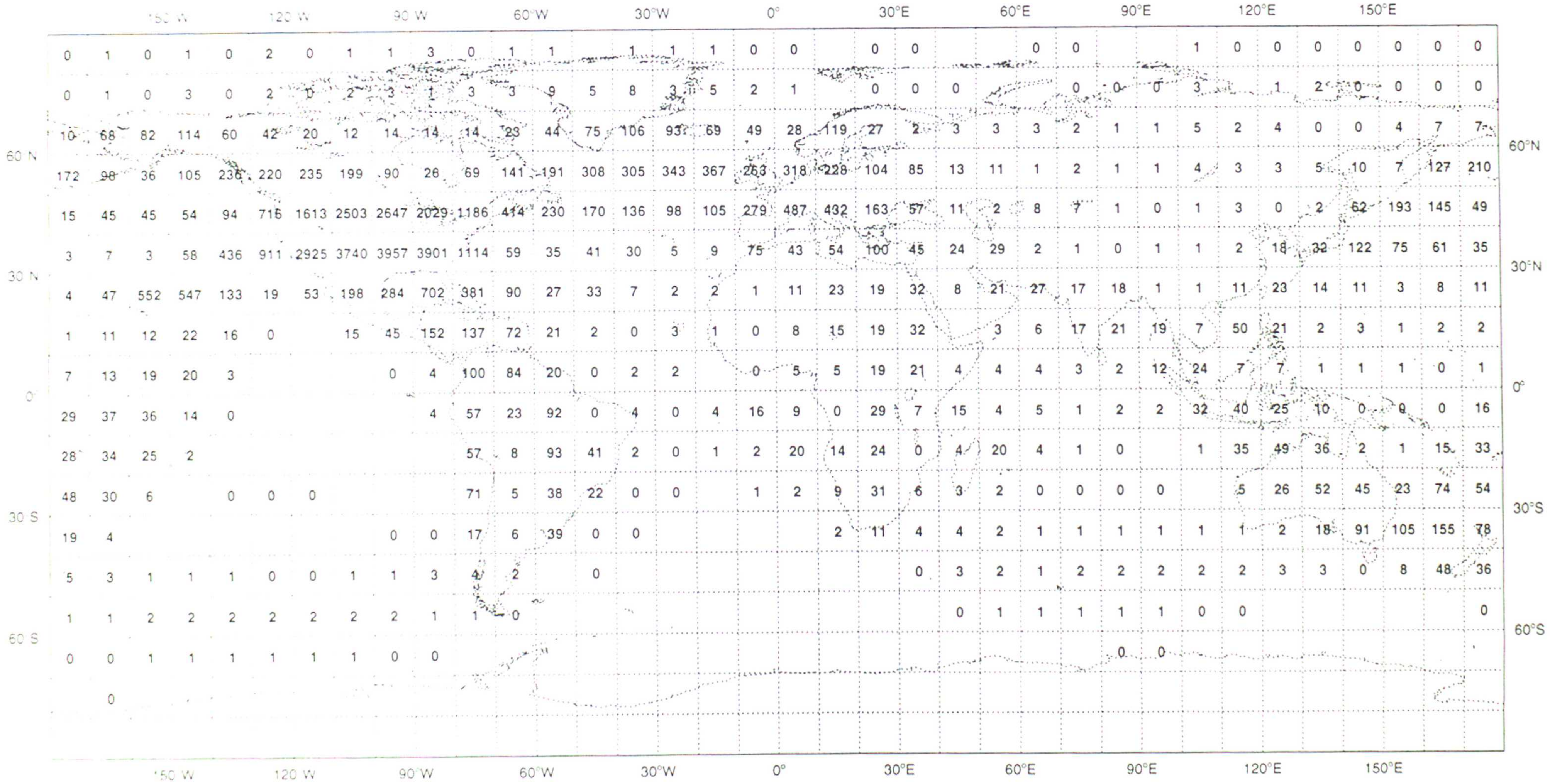
| | | |
|---|---|---|
| **Monitoring procedures** | | |
| **Period** | | :One calendar month. |
| **Data monitored** | | :Statistics for each airline carrier. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :All hours combined. |
| **Level(s) monitored** | | :1000.0 – 300.1 hPa |
| **Elements monitored** | | :TEMP in °C ; WIND in m $s^{-1}$ |
| **Parameters monitored** | :N REP. | :Number of observations received excluding duplicates. |
| | :PG | :Percentage of observations with gross errors. |
| | :PR | :Percentage of observations rejected by quality control including rejections from the duplicate check. |
| | :PC | :Percentage of observations with calm winds. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed. |
| GROSS ERROR LIMITS | | :10.0 °C ; 60 m $s^{-1}$ Vector Wind |
| SELECTION CRITERIA | | :N REP ≥ 20 |

**NB :** All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

|  |  | TEMPERATURE |  |  |  |  | WIND |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAL | 138 | 3 | 22 | 2.2 | 0.3 | 133 | 0 | 17 | 0 | 6.7 | 0.8 |
| AAR | 37 | 0 | 16 | 1.3 | -0.1 | 37 | 0 | 16 | 0 | 4.2 | 0.9 |
| ACA | 30 | 0 | 13 | 1.4 | 0.2 | 28 | 0 | 18 | 0 | 9.4 | 0.4 |
| ACI | 21 | 0 | 57 | 1.2 | -0.4 | 21 | 0 | 57 | 0 | 7.4 | -1.5 |
| AFR | 107 | 3 | 15 | 1.8 | 0.7 | 91 | 0 | 12 | 0 | 11.9 | 1.0 |
| ANZ | 236 | 1 | 42 | 1.2 | 0.1 | 236 | 0 | 42 | 0 | 6.4 | 0.1 |
| ARG | 36 | 8 | 17 | 3.1 | 1.4 | 34 | 3 | 6 | 0 | 9.7 | 5.2 |
| ASY | 23 | 0 | 52 | 2.9 | 1.0 | 21 | 0 | 43 | 0 | 6.7 | -0.7 |
| AXF | 59 | 0 | 34 | 1.7 | 0.9 | 59 | 0 | 32 | 0 | 5.6 | 0.9 |
| AZA | 27 | 0 | 0 | 0.8 | 0.2 | 25 | 0 | 0 | 0 | 5.2 | 1.1 |
| CFC | 106 | 1 | 7 | 1.9 | 0.3 | 92 | 0 | 5 | 0 | 6.7 | 1.4 |
| CFG | 33 | 0 | 0 | 1.7 | -1.0 | 26 | 0 | 8 | 0 | 7.5 | 0.4 |
| CLX | 23 | 0 | 17 | 2.5 | -1.3 | 23 | 0 | 13 | 0 | 6.6 | 1.1 |
| COA | 187 | 0 | 43 | 0.9 | -0.2 | 186 | 0 | 44 | 0 | 5.4 | 0.1 |
| CRL | 23 | 0 | 0 | 1.3 | 0.5 | 20 | 0 | 0 | 0 | 6.8 | -1.4 |
| CUB | 42 | 2 | 7 | 1.4 | 1.0 | 22 | 0 | 18 | 0 | 11.8 | 2.2 |
| DAL | 341 | 0 | 47 | 1.1 | 0.1 | 335 | 0 | 49 | 0 | 5.8 | 0.7 |
| DHL | 24 | 0 | 79 | 6.3 | -6.2 | 23 | 0 | 17 | 0 | 13.5 | -1.0 |
| DLH | 161 | 0 | 9 | 1.5 | 0.3 | 158 | 1 | 10 | 0 | 6.1 | 0.8 |
| EIA | 39 | 3 | 13 | 1.2 | -0.3 | 36 | 3 | 100 | 0 | 18.6 | 2.1 |
| EWW | 78 | 0 | 6 | 1.3 | 0.4 | 79 | 0 | 6 | 0 | 6.8 | 0.8 |
| FDX | 414 | 0 | 31 | 1.4 | 0.4 | 421 | 0 | 32 | 0 | 7.7 | 1.0 |
| FXI | 30 | 0 | 7 | 3.0 | 1.8 | 28 | 0 | 0 | 0 | 8.6 | 1.7 |
| GAF | 61 | 0 | 0 | 1.1 | 0.3 | 61 | 0 | 3 | 0 | 7.4 | 0.5 |
| GCO | 226 | 0 | 6 | 1.5 | 0.3 | 232 | 0 | 100 | 0 | 14.3 | 3.0 |
| GOF | 20 | 0 | 45 | 0.6 | 0.3 | 20 | 0 | 50 | 0 | 8.2 | 1.4 |
| GTI | 39 | 0 | 8 | 2.1 | -0.6 | 40 | 0 | 8 | 0 | 8.1 | 0.4 |
| HAL | 42 | 7 | 48 | 2.5 | 0.2 | 43 | 0 | 40 | 0 | 7.5 | 2.3 |
| IBE | 38 | 0 | 16 | 1.5 | 0.2 | 29 | 0 | 17 | 0 | 5.9 | 0.9 |
| ICE | 58 | 0 | 2 | 1.2 | -0.1 | 52 | 0 | 8 | 0 | 9.9 | -0.3 |
| JAA | 38 | 8 | 32 | 4.3 | -0.8 | 39 | 0 | 10 | 0 | 10.1 | 3.7 |
| JAL | 82 | 0 | 7 | 1.2 | 0.3 | 80 | 0 | 6 | 0 | 7.3 | 0.3 |
| JAZ | 90 | 0 | 4 | 1.9 | 0.9 | 89 | 0 | 9 | 0 | 8.4 | 1.4 |
| KAL | 55 | 5 | 27 | 1.8 | -0.6 | 56 | 0 | 21 | 0 | 5.7 | 0.6 |
| KIW | 97 | 16 | 60 | 3.0 | 1.9 | 98 | 0 | 53 | 0 | 7.5 | 0.5 |
| KLM | 66 | 0 | 5 | 1.9 | 0.3 | 61 | 0 | 3 | 0 | 7.5 | 0.7 |
| LAN | 152 | 6 | 16 | 2.9 | 0.4 | 152 | 0 | 6 | 0 | 9.6 | 3.6 |
| MAS | 29 | 0 | 28 | 1.0 | 0.2 | 29 | 0 | 28 | 0 | 4.5 | 0.3 |
| MPH | 45 | 0 | 0 | 1.4 | 0.4 | 44 | 0 | 0 | 0 | 6.6 | 0.4 |
| NCA | 53 | 0 | 2 | 1.5 | 0.5 | 37 | 0 | 14 | 0 | 11.0 | 0.6 |
| NWA | 471 | 1 | 9 | 1.5 | 0.6 | 461 | 0 | 10 | 0 | 8.2 | -0.5 |
| NZL | 21180 | 0 | 58 | 1.5 | 0.5 | 21180 | 0 | 58 | 0 | 5.3 | 0.1 |
| PAC | 23 | 9 | 13 | 1.1 | 0.1 | 24 | 8 | 17 | 0 | 14.1 | 3.5 |
| PAL | 27 | 4 | 7 | 1.3 | -0.3 | 26 | 0 | 4 | 0 | 4.6 | 0.6 |
| QFA | 141 | 0 | 40 | 1.2 | 0.5 | 142 | 0 | 41 | 0 | 5.2 | 0.2 |
| RCH | 138 | 0 | 100 | 4.2 | -2.1 | 116 | 2 | 100 | 0 | 12.3 | 2.4 |
| RRR | 143 | 4 | 19 | 2.6 | 1.3 | 143 | 1 | 16 | 0 | 10.7 | 0.9 |
| SAA | 67 | 0 | 1 | 1.1 | -0.5 | 65 | 2 | 3 | 0 | 6.1 | -0.5 |
| SIA | 45 | 0 | 4 | 1.1 | 0.4 | 45 | 0 | 4 | 0 | 4.9 | 1.8 |
| SQC | 20 | 0 | 5 | 1.2 | 0.6 | 20 | 0 | 5 | 0 | 5.7 | 2.0 |
| UAL | 260552 | 0 | 99 | 1.2 | 0.0 | 260219 | 0 | 99 | 0 | 4.3 | 0.3 |
| UPS | 130 | 1 | 42 | 1.5 | 0.4 | 133 | 1 | 39 | 0 | 6.4 | 0.2 |
| VTA | 23 | 4 | 26 | 2.6 | -0.9 | 30 | 0 | 10 | 0 | 4.7 | 0.3 |
| VVP | 102 | 10 | 66 | 5.1 | 1.0 | 103 | 0 | 50 | 0 | 11.7 | 2.9 |
| WOA | 37 | 0 | 5 | 1.2 | 0.8 | 39 | 0 | 28 | 0 | 13.0 | 2.0 |

|  |  | TEMPERATURE |  |  |  |  |  | WIND |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AR | 527 | 0 | 100 | 2.0 | 1.6 | 529 | 0 | 47 | 0 | 4.7 | 0.8 |
| AU | 22298 | 0 | 49 | 1.1 | 0.4 | 22299 | 0 | 50 | 0 | 3.9 | 0.3 |
| EU | 532627 | 0 | 68 | 1.0 | 0.2 | 530185 | 0 | 68 | 0 | 3.9 | 0.1 |
| KL | 925 | 0 | 58 | 1.5 | 0.4 | 919 | 0 | 58 | 0 | 4.6 | 0.4 |
| LH | 678 | 0 | 58 | 1.2 | 0.6 | 670 | 0 | 58 | 0 | 4.1 | 0.9 |
| MK | 3106 | 0 | 54 | 1.4 | 0.7 | 3098 | 0 | 54 | 0 | 4.6 | 0.4 |
| SA | 5437 | 0 | 81 | 1.6 | 0.8 | 5428 | 0 | 59 | 0 | 4.7 | 0.8 |
| WA | 40 | 3 | 13 | 2.0 | -0.1 | 39 | 3 | 8 | 0 | 5.1 | 1.3 |
| XX | 645 | 4 | 10 | 1.5 | 0.1 | 642 | 1 | 11 | 0 | 10.2 | 1.7 |
| US ACARS | 1753171 | 0 | 78 | 1.3 | 0.3 | 1746957 | 0 | 78 | 0 | 4.4 | 0.2 |

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 44512



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 3 | 0 | 1 | 1 | | 1 | 1 | 1 | 0 | 0 | | 0 | 0 | | | 0 | 0 | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 3 | 0 | 2 | 0 | 2 | 3 | 1 | 3 | 3 | 9 | 5 | 8 | 3 | 5 | 2 | 1 | | 0 | 0 | 0 | | | 0 | 0 | 0 | 3 | | 1 | 2 | 0 | 0 | 0 | 0 |
| 10 | 68 | 82 | 114 | 60 | 42 | 20 | 12 | 14 | 14 | 14 | 23 | 44 | 75 | 106 | 93 | 69 | 49 | 28 | 119 | 27 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 5 | 2 | 4 | 0 | 0 | 4 | 7 | 7 |
| 172 | 98 | 36 | 105 | 236 | 220 | 235 | 199 | 90 | 26 | 69 | 141 | 191 | 308 | 305 | 343 | 367 | 263 | 318 | 228 | 104 | 85 | 13 | 11 | 1 | 2 | 1 | 1 | 4 | 3 | 3 | 5 | 10 | 7 | 127 | 210 |
| 15 | 45 | 45 | 54 | 94 | 716 | 1613 | 2503 | 2647 | 2029 | 1186 | 414 | 230 | 170 | 136 | 98 | 105 | 279 | 487 | 432 | 163 | 57 | 11 | 2 | 8 | 7 | 1 | 0 | 1 | 3 | 0 | 2 | 62 | 193 | 145 | 49 |
| 3 | 7 | 3 | 58 | 436 | 911 | 2925 | 3740 | 3957 | 3901 | 1114 | 59 | 35 | 41 | 30 | 5 | 9 | 75 | 43 | 54 | 100 | 45 | 24 | 29 | 2 | 1 | 0 | 1 | 1 | 2 | 18 | 32 | 122 | 75 | 61 | 35 |
| 4 | 47 | 552 | 547 | 133 | 19 | 53 | 198 | 284 | 702 | 381 | 90 | 27 | 33 | 7 | 2 | 2 | 1 | 11 | 23 | 19 | 32 | 8 | 21 | 27 | 17 | 18 | 1 | 1 | 11 | 23 | 14 | 11 | 3 | 8 | 11 |
| 1 | 11 | 12 | 22 | 16 | 0 | | 15 | 45 | 152 | 137 | 72 | 21 | 2 | 0 | 3 | 1 | 0 | 8 | 15 | 19 | 32 | | 3 | 6 | 17 | 21 | 19 | 7 | 50 | 21 | 2 | 3 | 1 | 2 | 2 |
| 7 | 13 | 19 | 20 | 3 | | | | 0 | 4 | 100 | 84 | 20 | 0 | 2 | 2 | | 0 | 5 | 5 | 19 | 21 | 4 | 4 | 4 | 3 | 2 | 12 | 24 | 7 | 7 | 1 | 1 | 1 | 0 | 1 |
| 29 | 37 | 36 | 14 | 0 | | | | | 4 | 57 | 23 | 92 | 0 | 4 | 0 | 4 | 16 | 9 | 0 | 29 | 7 | 15 | 4 | 5 | 1 | 2 | 2 | 32 | 40 | 25 | 10 | 0 | 0 | 0 | 16 |
| 28 | 34 | 25 | 2 | | | | | | | 57 | 8 | 93 | 41 | 2 | 0 | 1 | 2 | 20 | 14 | 24 | 0 | 4 | 20 | 4 | 1 | 0 | | 1 | 35 | 49 | 36 | 2 | 1 | 15 | 33 |
| 48 | 30 | 6 | | 0 | 0 | 0 | | | | 71 | 5 | 38 | 22 | 0 | 0 | | 1 | 2 | 9 | 31 | 6 | 3 | 2 | 0 | 0 | 0 | 0 | | 5 | 26 | 52 | 45 | 23 | 74 | 54 |
| 19 | 4 | | | | | | | 0 | 0 | 17 | 6 | 39 | 0 | 0 | | | | | 2 | 11 | 4 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 18 | 91 | 105 | 155 | 78 |
| 5 | 3 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 3 | 4 | 2 | | 0 | | | | | | | | 0 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 0 | 8 | 48 | 36 |
| 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | | | | | | | | | | | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | | | | | | 0 |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | | | | | | | | | | | | | | | | | 0 | 0 | | | | | | | | |
| | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 83775

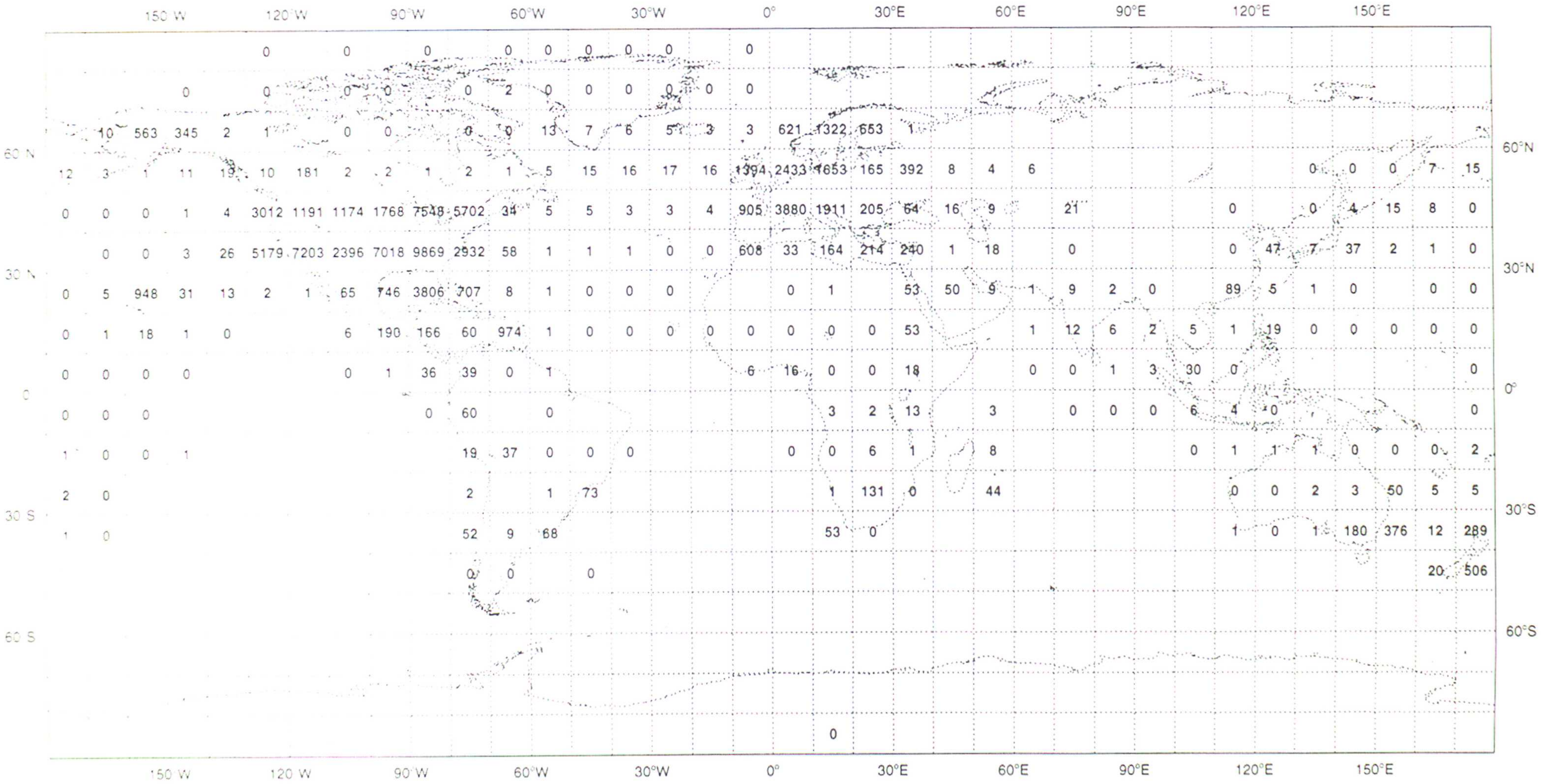

150 W
120 W
90 W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60 N
30 N
0
30 S
60 S
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0
0 0 0 0 0 2 0 0 0 0 0 0
10 563 345 2 1 0 0 0 0 13 7 6 5 3 3 621 1322 653 1
12 3 1 11 19 10 181 2 2 1 2 1 5 15 16 17 16 1394 2433 1653 165 392 8 4 6 0 0 0 7 15
0 0 0 1 4 3012 1191 1174 1768 7548 5702 34 5 5 3 3 4 905 3880 1911 205 64 16 9 21 0 0 4 15 8 0
0 0 3 26 5179 7203 2396 7018 9869 2932 58 1 1 1 0 0 608 33 164 214 240 1 18 0 0 47 7 37 2 1 0
0 5 948 31 13 2 1 65 746 3806 707 8 1 0 0 0 0 1 53 50 9 1 9 2 0 89 5 1 0 0 0
0 1 18 1 0 6 190 166 60 974 1 0 0 0 0 0 0 0 0 53 1 12 6 2 5 1 19 0 0 0 0 0
0 0 0 0 0 1 36 39 0 1 6 16 0 0 18 0 0 1 3 30 0 0
0 0 0 0 60 0 3 2 13 3 0 0 0 6 4 0 0
1 0 0 1 19 37 0 0 0 0 0 6 1 8 0 1 1 1 0 0 0 2
2 0 2 1 73 1 131 0 44 0 0 2 3 50 5 5
1 0 52 9 68 53 0 1 0 1 180 376 12 289
0 0 0 20 506
0
150 W
120 W
90 W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

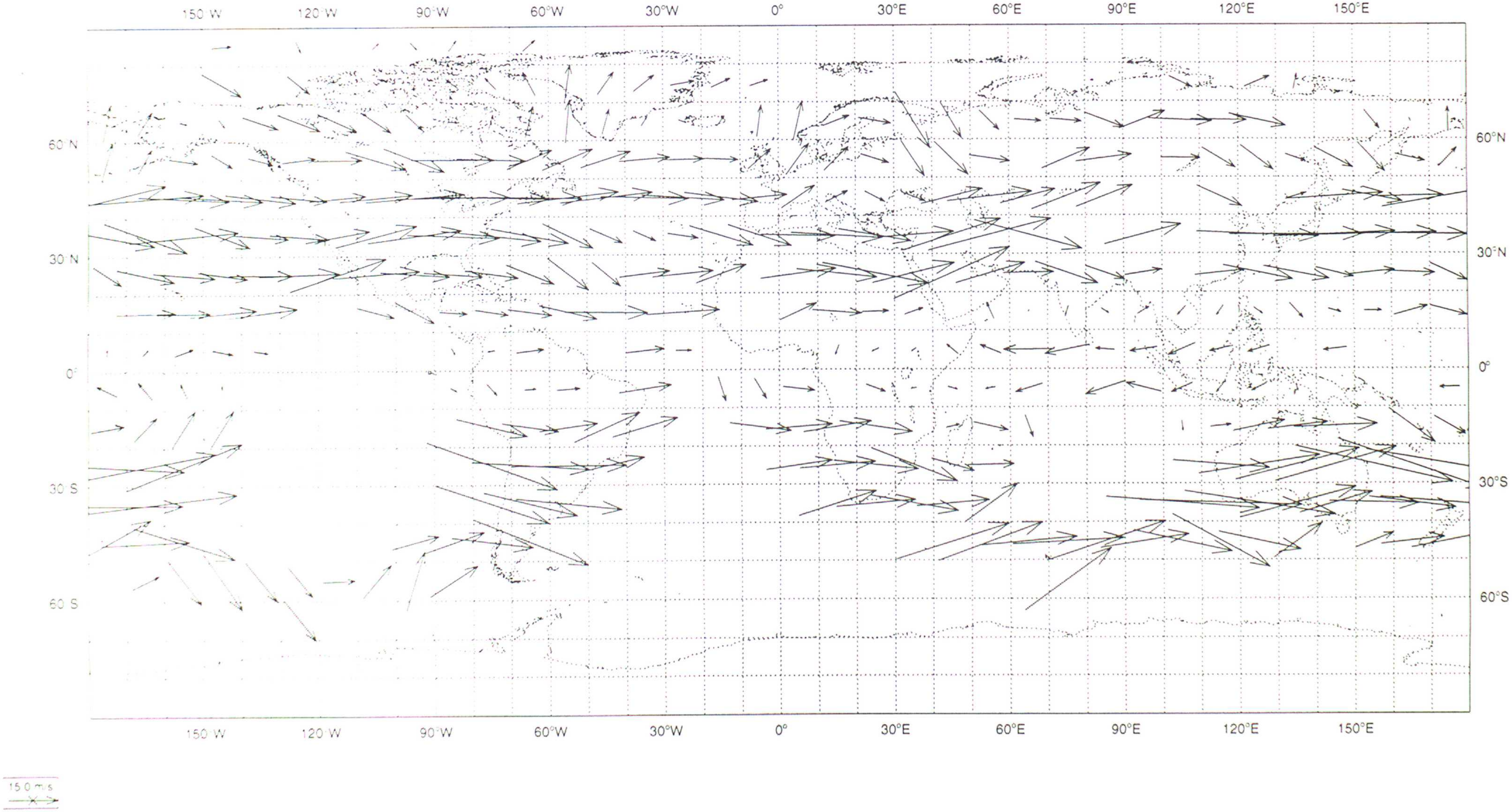

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

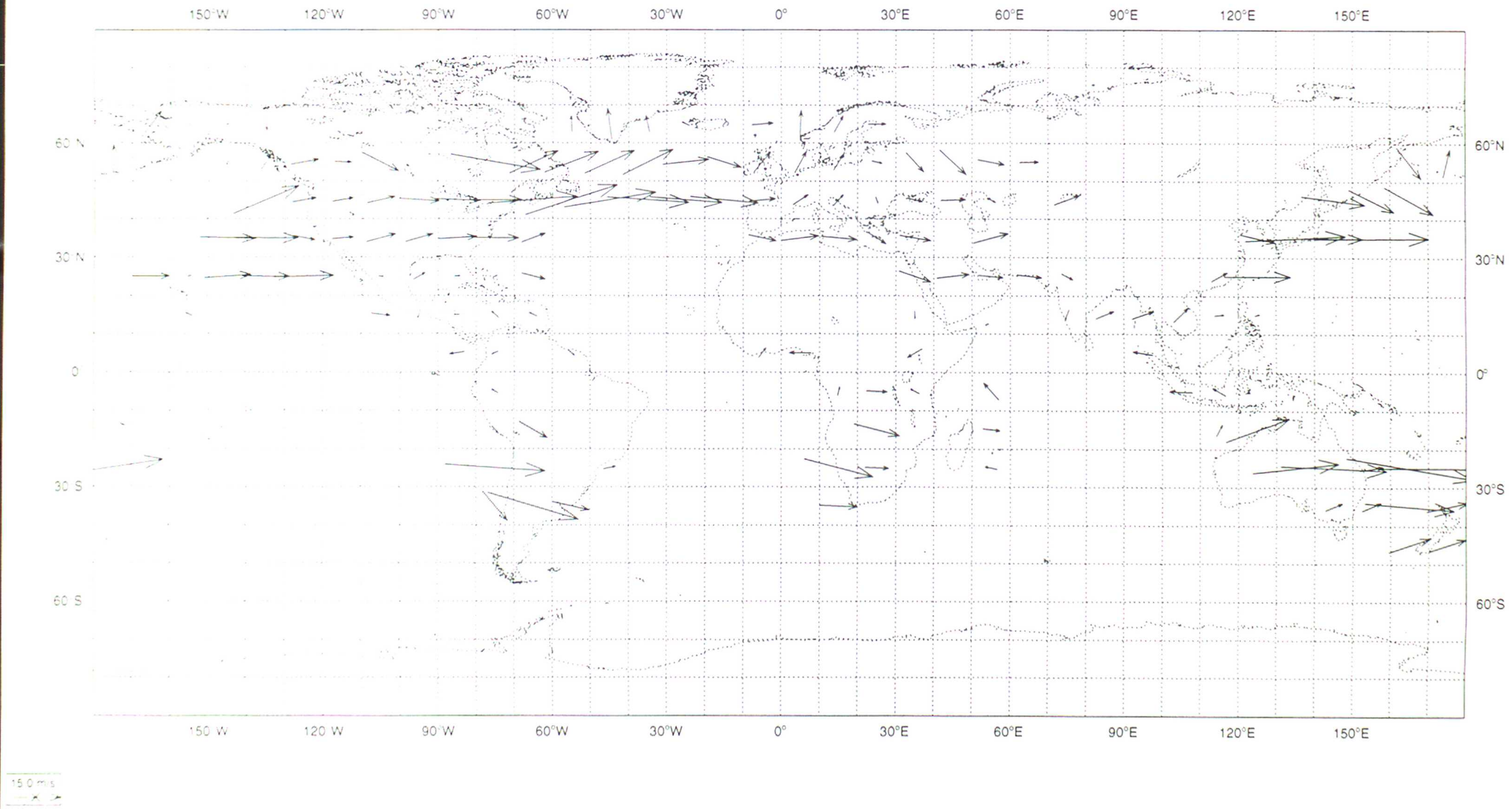

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0
30°S
60°S
15.0 m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

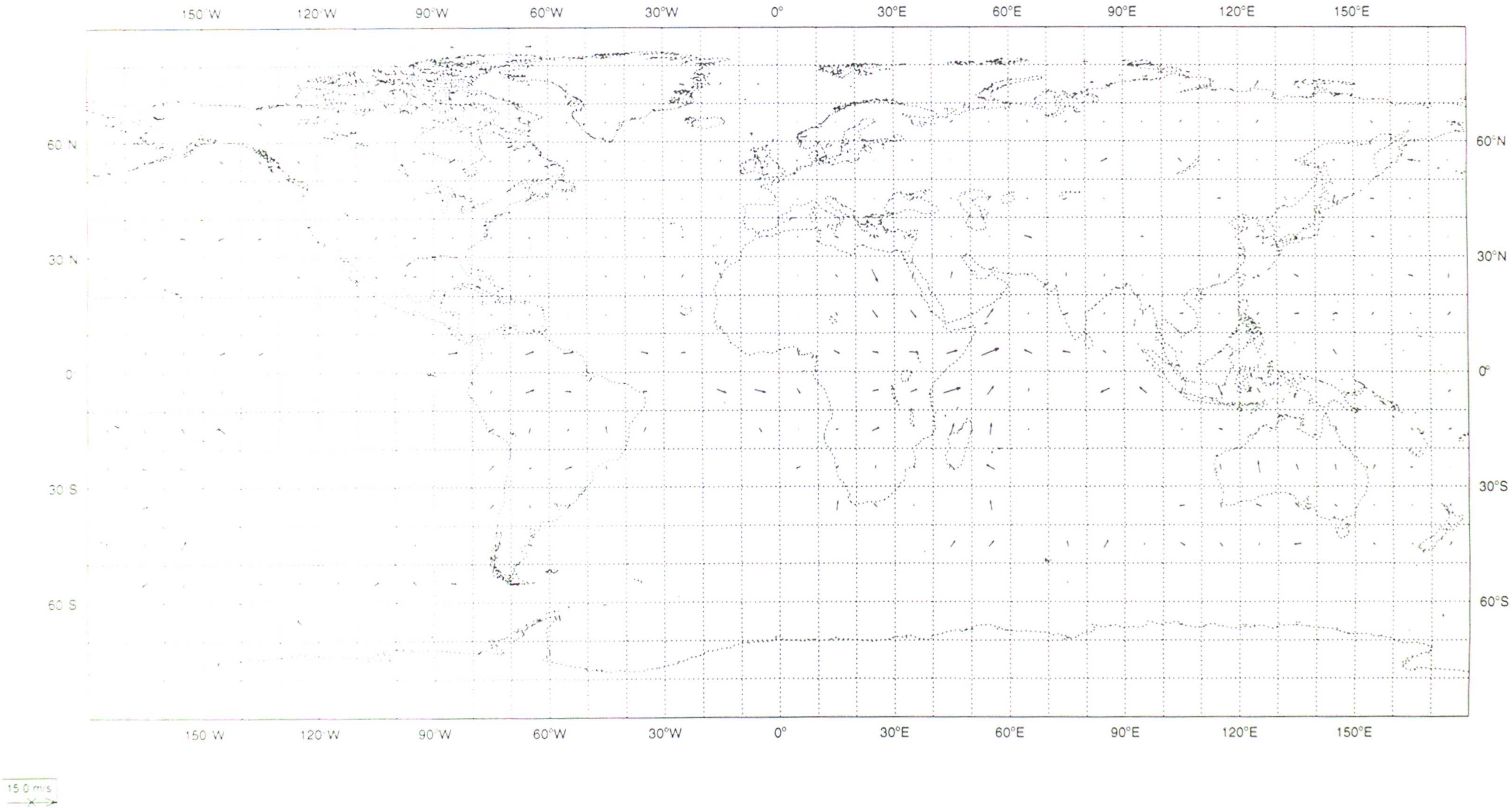

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

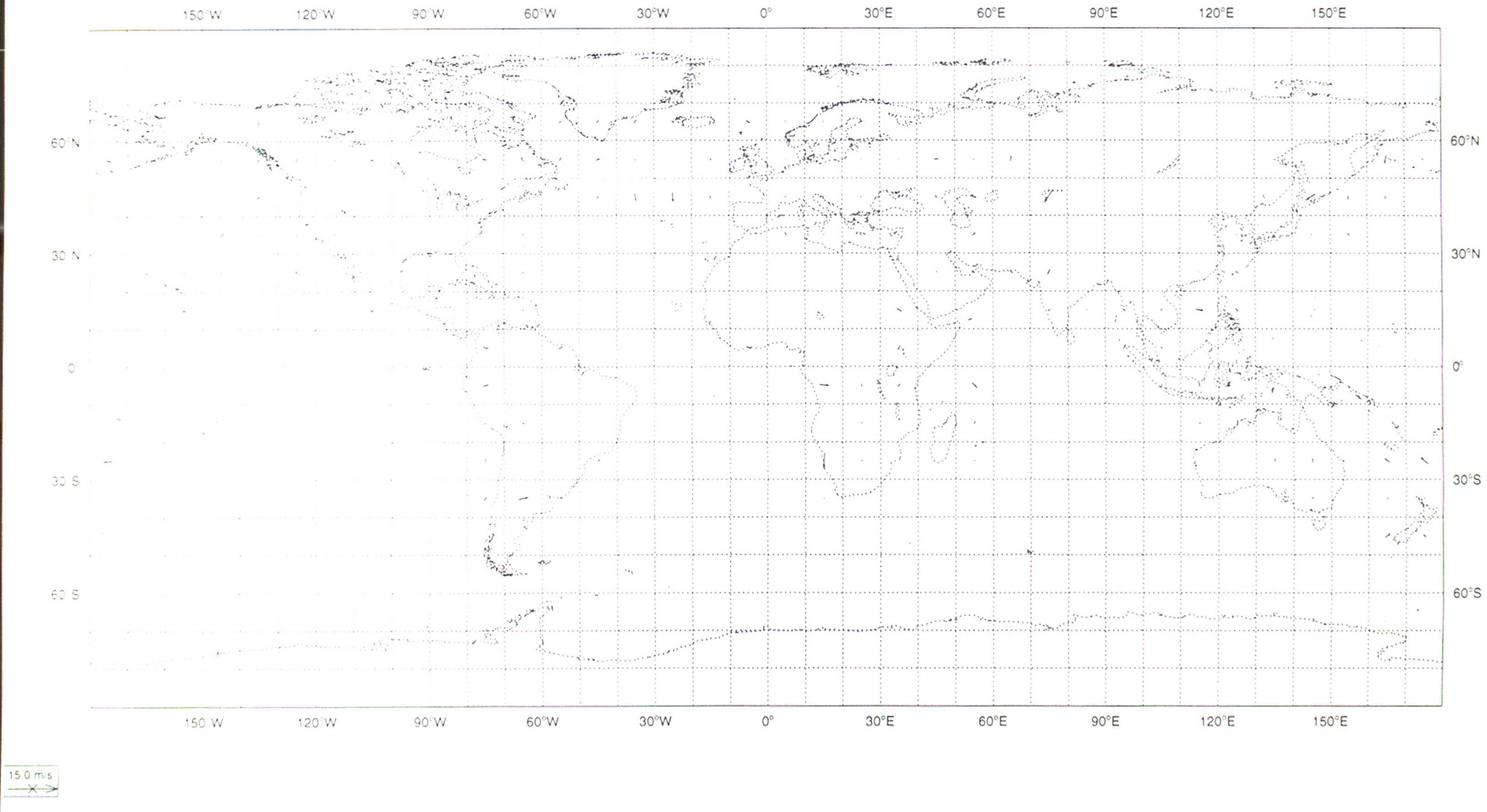

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

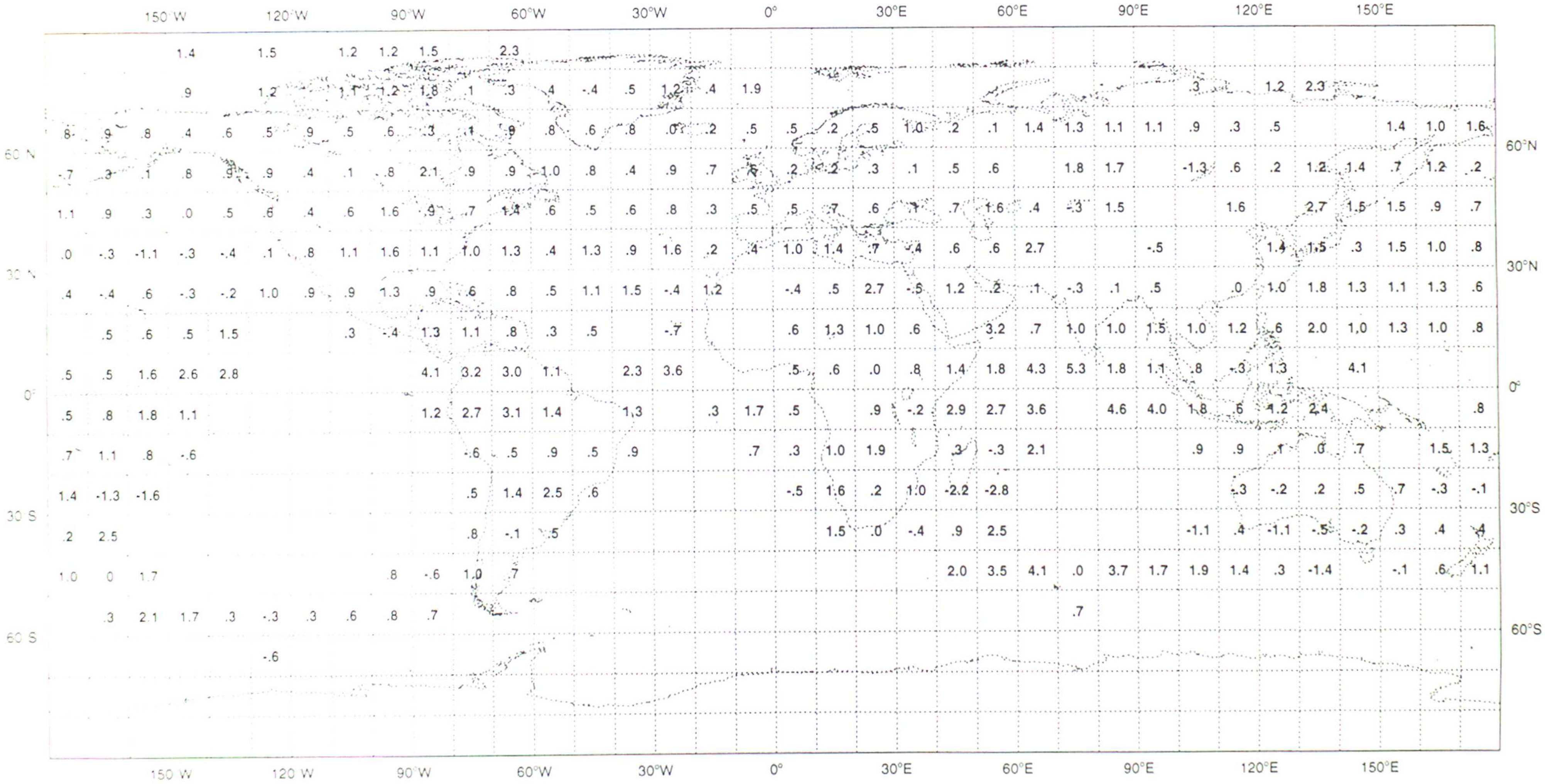

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

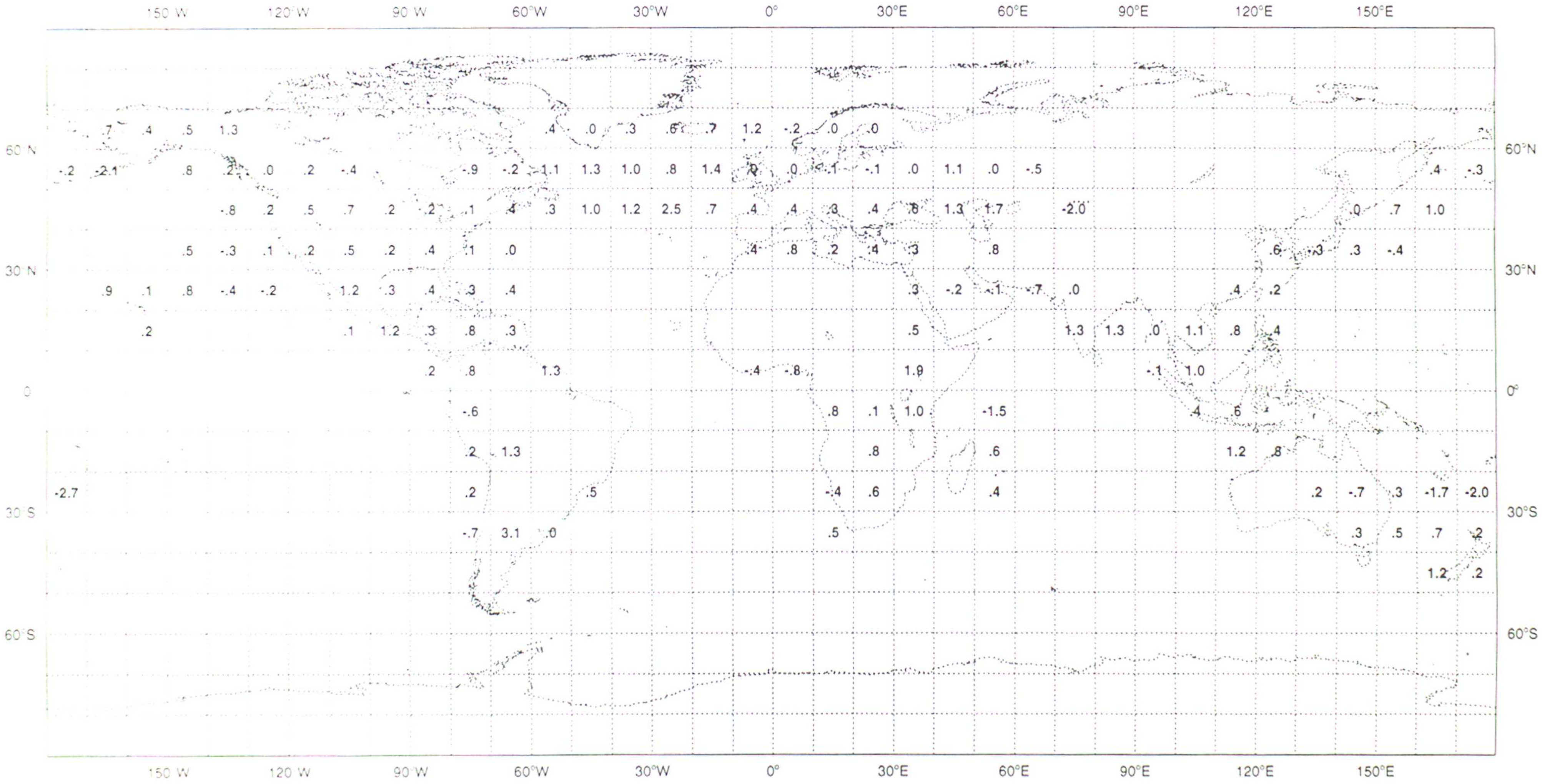

150 W
120 W
90 W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60 N
30 N
0
30 S
60 S
60°N
30°N
0°
30°S
60°S
.7 .4 .5 1.3 .4 .0 .3 .6 .7 1.2 -.2 .0 .0
-.2 -2.1 .8 .2 .0 .2 -.4 -.9 -.2 -1.1 1.3 1.0 .8 1.4 .0 .0 -.1 -.1 .0 1.1 .0 -.5 .4 -.3
-.8 .2 .5 .7 .2 .2 .1 .4 .3 1.0 1.2 2.5 .7 .4 .4 .3 .4 .8 1.3 1.7 -2.0 .0 .7 1.0
.5 -.3 .1 .2 .5 .2 .4 .1 .0 .4 .8 .2 .4 .3 .8 .6 .3 .3 -.4
.9 .1 .8 -.4 -.2 1.2 .3 .4 .3 .4 .3 -.2 -.1 -.7 .0 .4 .2
.2 .1 1.2 .3 .8 .3 .5 1.3 1.3 .0 1.1 .8 .4
.2 .8 1.3 -.4 -.8 1.9 -.1 1.0
-.6 .8 .1 1.0 -1.5 .4 .6
.2 1.3 .8 .6 1.2 .8
-2.7 .2 .5 -.4 .6 .4 .2 -.7 .3 -1.7 -2.0
-.7 3.1 .0 .5 .3 .5 .7 .2
1.2 .2

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

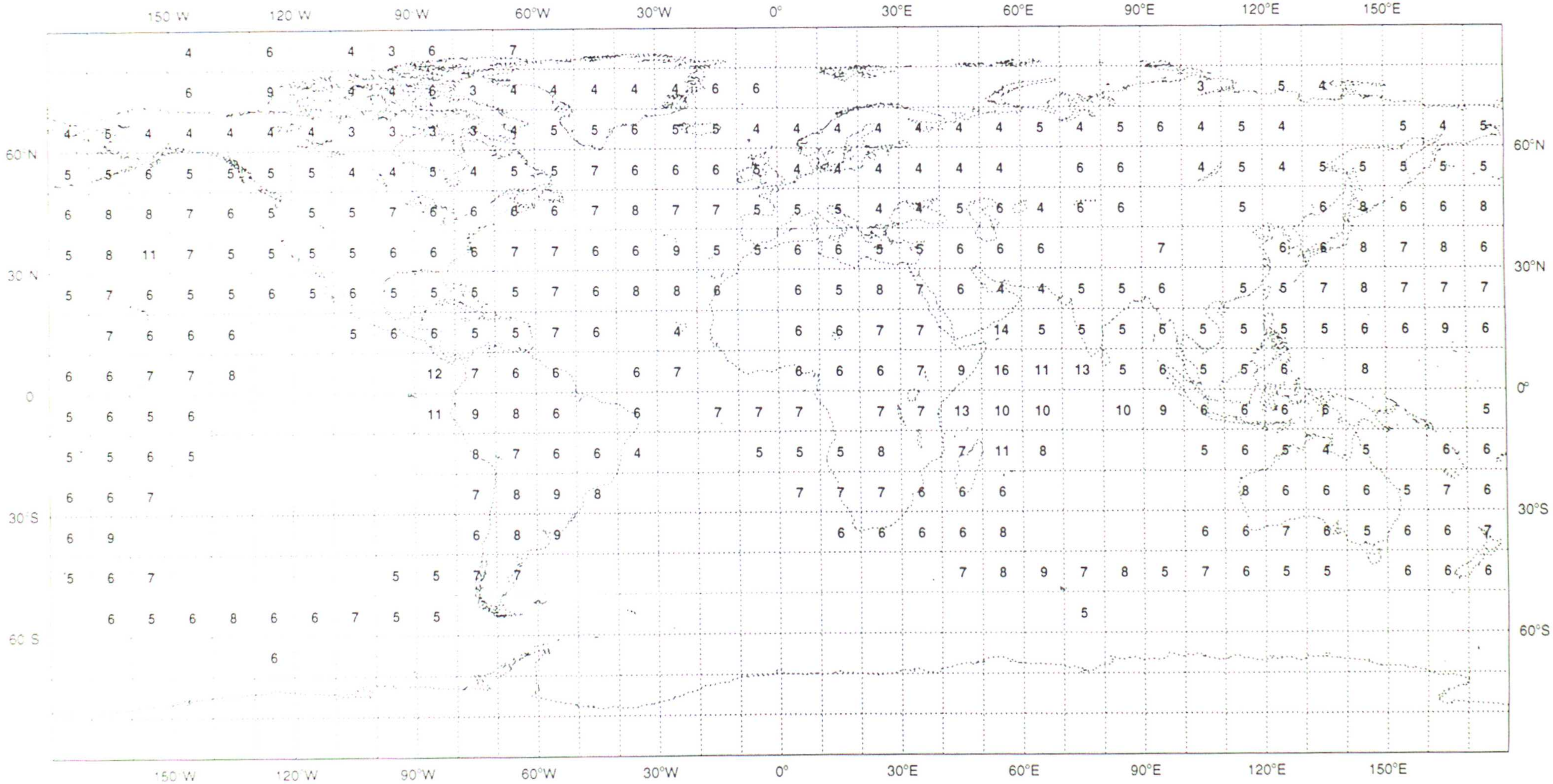
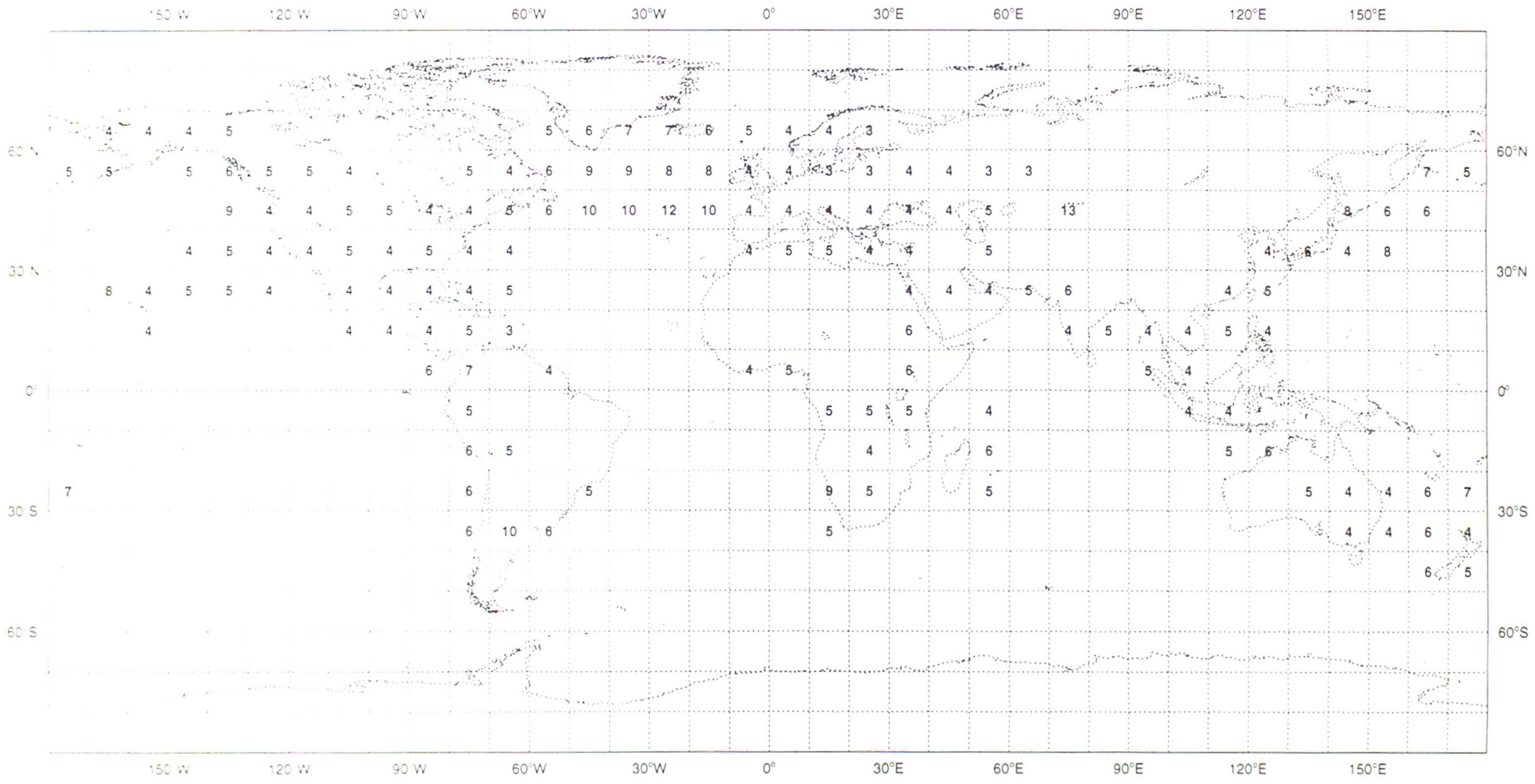

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 6 4 3 6 7
6 9 4 6 3 4 4 4 4 4 6 6 3 5 4
4 5 4 4 4 4 4 3 3 3 3 4 5 5 6 5 5 4 4 4 4 4 4 4 5 4 5 6 4 5 4 5 4 5
5 5 6 5 5 5 5 4 4 5 4 5 5 7 6 6 6 5 4 4 4 4 4 4 6 6 4 5 4 5 5 5 5 5
6 8 8 7 6 5 5 5 7 6 6 6 6 7 8 7 7 5 5 5 4 4 5 6 4 6 6 5 6 8 6 6 8
5 8 11 7 5 5 5 5 6 6 6 7 7 6 6 9 5 5 6 6 5 5 6 6 6 7 6 6 8 7 8 6
5 7 6 5 5 6 5 6 5 5 6 5 7 6 8 8 6 6 5 8 7 6 4 4 5 5 6 5 5 7 8 7 7 7
7 6 6 6 5 6 6 5 5 7 6 4 6 6 7 7 14 5 5 5 5 5 5 5 5 6 6 9 6
6 6 7 7 8 12 7 6 6 6 7 6 6 6 7 9 16 11 13 5 6 5 5 6 8
5 6 5 6 11 9 8 6 6 7 7 7 7 7 13 10 10 10 9 6 6 6 6 5
5 5 6 5 8 7 6 6 4 5 5 5 8 7 11 8 5 6 5 4 5 6 6
6 6 7 7 8 9 8 7 7 7 6 6 6 8 6 6 6 5 7 6
6 9 6 8 9 6 6 6 6 8 6 6 7 6 5 6 6 7
5 6 7 5 5 7 7 7 8 9 7 8 5 7 6 5 5 6 6 6
6 5 6 8 6 6 7 5 5 5
6

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). MAY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 4 4 5 5 6 7 7 6 5 4 4 3
5 5 5 6 5 5 4 5 4 6 9 9 8 8 4 4 3 3 4 4 3 3 7 5
9 4 4 5 5 4 4 5 6 10 10 12 10 4 4 4 4 4 4 5 13 8 6 6
4 5 4 4 5 4 5 4 4 4 5 5 4 4 5 4 6 4 8
8 4 5 5 4 4 4 4 4 5 4 4 4 5 6 4 5
4 4 4 4 5 3 6 4 5 4 4 5 4
6 7 4 4 5 6 5 4
5 5 5 5 4 4 4
6 5 4 6 5 6
7 6 5 9 5 5 5 4 4 6 7
6 10 6 5 4 4 6 4
6 5

# TABLE 5

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for radiosonde TEMPs. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00 UTC and 12 UTC. |
| **Level(s) monitored** | | :Standard levels between 1000.0 - 30.0 hPa |
| **Element monitored** | | :GEOPOTENTIAL HEIGHT IN metres |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown duringperiod. |
| | :% REJ | :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors. |
| | :SD | :SD of difference of observations from background values at level shown excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |
| | :NUM LEVELS | :Number of levels satisfying selection criteria. |
| **GROSS ERROR LIMITS** | :Defined in Appendix I.1 | |
| **SELECTION CRITERIA** | : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS. | |

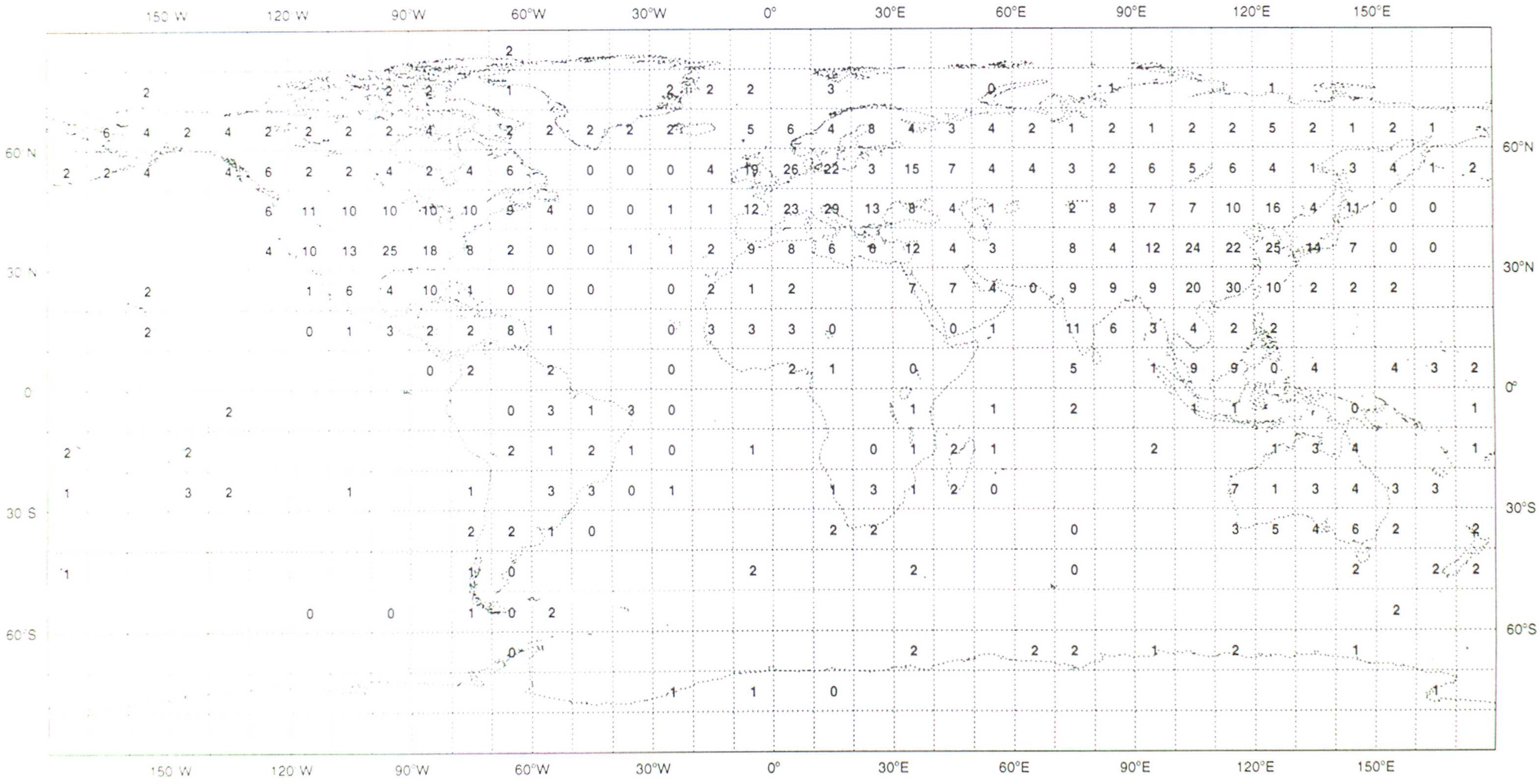
**ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS**

| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | SD | BIAS | RMS | NUM LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|
| 26477 | 12 | Z | 300 | 56/ 31 | 4 | 15 | 48.2 | 145.5 | 153.3 | 8 |
| 31168 | 00 | Z | 200 | 56/ 138 | 16 | 0 | 44.5 | 92.0 | 102.2 | 4 |
| 34247 | 12 | Z | 50 | 50/ 41 | 28 | 0 | 63.5 | 193.9 | 204.0 | 7 |
| 40394 | 12 | Z | 1000 | 27/ 42 | 24 | 0 | 8.7 | -41.7 | 42.6 | 5 |
| 40430 | 12 | Z | 30 | 25/ 40 | 18 | 0 | 38.7 | 239.6 | 242.7 | 4 |
| 40437 | 12 | Z | 30 | 25/ 47 | 23 | 0 | 52.2 | 212.7 | 219.0 | 4 |
| 41594 | 12 | Z | 200 | 32/ 73 | 20 | 1 | 88.9 | 16.0 | 90.4 | 6 |
| 42027 | 00 | Z | 1000 | 34/ 75 | 29 | 1 | 14.8 | 37.3 | 40.1 | 8 |
| 42027 | 12 | Z | 1000 | 34/ 75 | 15 | 0 | 51.2 | -30.5 | 59.6 | 5 |
| 42314 | 00 | Z | 50 | 27/ 95 | 15 | 0 | 88.3 | 167.9 | 189.7 | 7 |
| 42314 | 12 | Z | 50 | 27/ 95 | 11 | 0 | 146.7 | 112.8 | 185.1 | 7 |
| 42339 | 00 | Z | 70 | 26/ 73 | 14 | 0 | 151.9 | 99.7 | 181.7 | 5 |
| 42339 | 12 | Z | 150 | 26/ 73 | 20 | 0 | 132.2 | 87.4 | 158.5 | 7 |
| 42369 | 00 | Z | 30 | 27/ 81 | 8 | 2 | 100.6 | 299.5 | 315.9 | 4 |
| 42369 | 12 | Z | 50 | 27/ 81 | 9 | 5 | 81.8 | 259.9 | 272.4 | 9 |
| 42492 | 00 | Z | 50 | 26/ 85 | 12 | 0 | 87.9 | 179.8 | 200.2 | 4 |
| 42492 | 12 | Z | 50 | 26/ 85 | 14 | 0 | 59.2 | 196.4 | 205.1 | 5 |
| 42647 | 00 | Z | 50 | 23/ 73 | 11 | 1 | 154.0 | 162.7 | 224.1 | 4 |
| 42647 | 12 | Z | 300 | 23/ 73 | 21 | 0 | 47.6 | 99.4 | 110.2 | 7 |
| 42701 | 12 | Z | 200 | 23/ 85 | 18 | 0 | 76.1 | -12.3 | 77.1 | 4 |
| 42809 | 00 | Z | 30 | 23/ 88 | 18 | 1 | 98.6 | 302.9 | 318.5 | 4 |
| 42867 | 00 | Z | 150 | 21/ 79 | 18 | 1 | 102.8 | -26.4 | 106.2 | 5 |
| 42971 | 00 | Z | 30 | 20/ 86 | 12 | 2 | 103.2 | 247.7 | 268.4 | 4 |
| 42971 | 12 | Z | 50 | 20/ 86 | 14 | 1 | 97.6 | 170.5 | 196.5 | 5 |
| 43003 | 00 | Z | 150 | 19/ 73 | 24 | 0 | 70.8 | -76.3 | 104.0 | 4 |
| 43003 | 12 | Z | 300 | 19/ 73 | 27 | 0 | 63.8 | 39.7 | 75.2 | 7 |
| 43014 | 00 | Z | 150 | 20/ 75 | 11 | 0 | 80.4 | 90.4 | 120.9 | 6 |
| 43014 | 12 | Z | 200 | 20/ 75 | 10 | 2 | 111.3 | 32.0 | 115.8 | 6 |
| 43128 | 00 | Z | 30 | 17/ 78 | 9 | 0 | 92.3 | 175.0 | 197.8 | 4 |
| 43185 | 00 | Z | 30 | 16/ 81 | 9 | 2 | 92.5 | 289.4 | 303.9 | 6 |
| 43185 | 12 | Z | 50 | 16/ 81 | 12 | 5 | 94.1 | 261.6 | 278.0 | 10 |
| 43192 | 00 | Z | 100 | 15/ 74 | 16 | 0 | 137.3 | -146.7 | 201.0 | 6 |
| 43279 | 00 | Z | 50 | 13/ 80 | 16 | 0 | 121.9 | 145.9 | 190.1 | 7 |
| 43295 | 00 | Z | 30 | 13/ 78 | 15 | 1 | 116.9 | 248.8 | 274.9 | 6 |
| 43333 | 00 | Z | 50 | 12/ 93 | 10 | 0 | 99.7 | 144.6 | 175.7 | 5 |
| 43333 | 12 | Z | 100 | 12/ 93 | 19 | 0 | 86.4 | -80.8 | 118.3 | 4 |
| 43346 | 00 | Z | 100 | 11/ 80 | 19 | 1 | 99.5 | -91.2 | 135.0 | 4 |
| 43346 | 12 | Z | 50 | 11/ 80 | 16 | 2 | 123.1 | 219.4 | 251.6 | 7 |
| 43353 | 00 | Z | 100 | 10/ 76 | 9 | 2 | 106.5 | -153.4 | 186.8 | 4 |
| 43369 | 00 | Z | 150 | 8/ 73 | 13 | 0 | 81.7 | -116.0 | 141.9 | 4 |
| 43369 | 12 | Z | 150 | 8/ 73 | 13 | 0 | 93.9 | -18.6 | 95.7 | 4 |
| 43371 | 00 | Z | 100 | 8/ 77 | 24 | 1 | 81.8 | -133.2 | 156.4 | 4 |
| 47122 | 00 | Z | 30 | 37/ 127 | 28 | 0 | 48.4 | 227.7 | 232.8 | 4 |
| 72208 | 12 | Z | 70 | 33/ -80 | 24 | 1 | 124.4 | 62.0 | 139.0 | 5 |
| 82599 | 12 | Z | 50 | -6/ -35 | 3 | 0 | 3.7 | 154.0 | 154.0 | 4 |
| 83746 | 12 | Z | 50 | -23/ -43 | 5 | 0 | 10.3 | 158.4 | 158.7 | 4 |
| 83840 | 12 | Z | 50 | -26/ -49 | 4 | 0 | 44.7 | 157.0 | 163.2 | 4 |
| 91366 | 00 | Z | 70 | 9/ 168 | 22 | 0 | 69.7 | 129.3 | 146.9 | 4 |

Figure 8. TEMP 500 hPa geopotential mean daily count. MAY 2002

All hours

Global average number of observations in 24 hours = 1154


150 W
120 W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60 N
30 N
0
30 S
60 S
60°N
30°N
0°
30°S
60°S

# TABLE 6

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for radiosonde TEMPs. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00 UTC and 12 UTC. |
| **Level(s) monitored** | | :Standard levels between 1000.0 - 100.0 hPa |
| **Element monitored** | | :VECTOR WIND in m $s^{-1}$ |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :% REJ | :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors. |
| | :UBIAS,VBIAS | :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |
| | :NUM LEVELS | :Number of levels satisfying selection criteria. |
| **GROSS ERROR LIMITS** | :Defined in Appendix I.2 | |
| **SELECTION CRITERIA** | : ≥ 10 observations and ≥ 15 m $s^{-1}$ RMS vector wind. | |

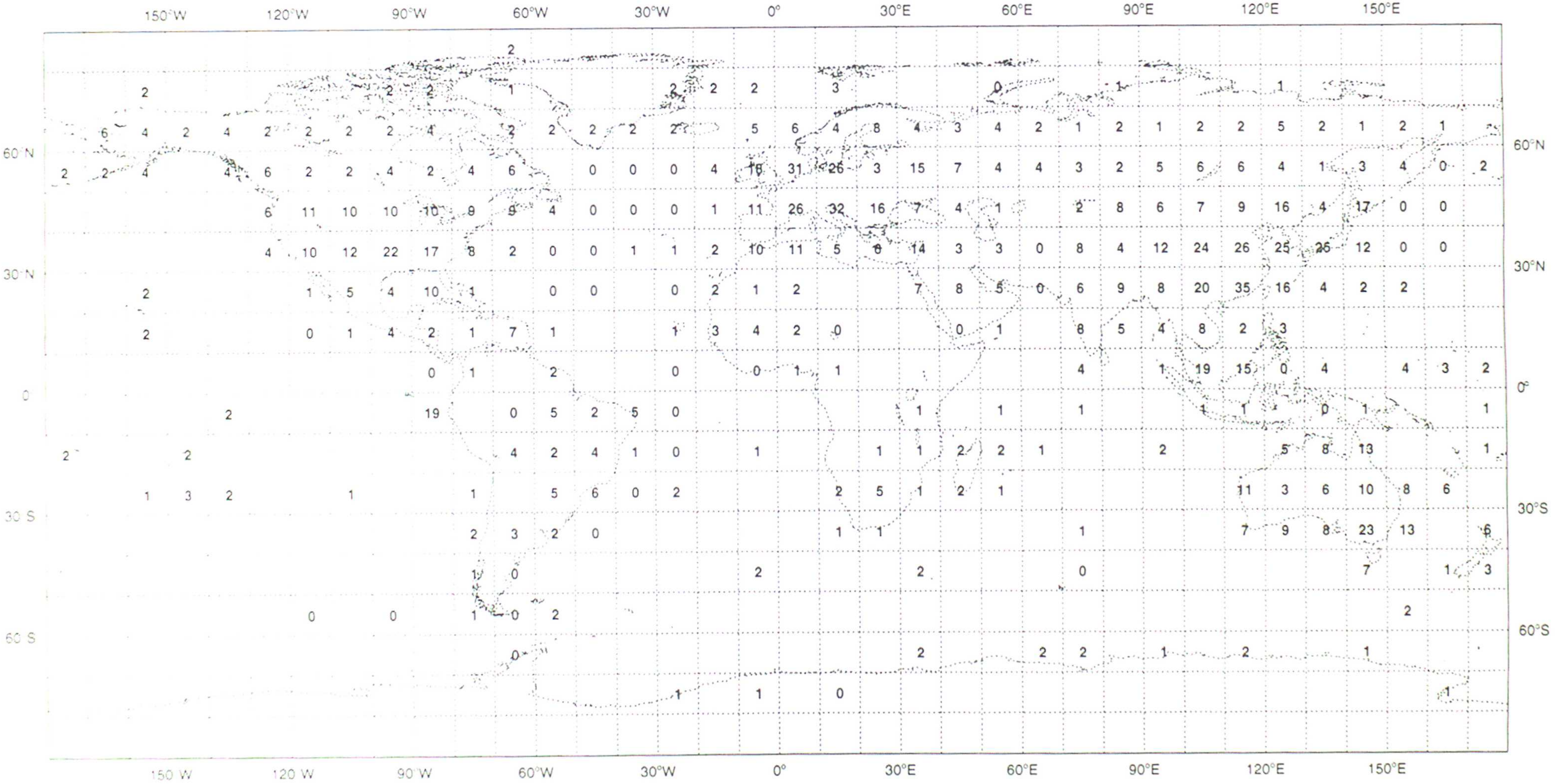
**ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN**

| WMO IDENT | OBS TIME | ELM | LEV | LAT/LONG | NUM OBS | NUM GROSS | % REJ | UBIAS | VBIAS | RMS | LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSPIU | 00 | V | 150 | -5/ -81 | 30 | 0 | 100 | 0.0 | 0.7 | 28.1 | 3 |
| PSPIU | 12 | V | 100 | -5/ -81 | 25 | 0 | 100 | -4.9 | 0.5 | 22.5 | 3 |
| 38341 | 00 | V | 300 | 43/ 71 | 15 | 0 | 100 | -2.0 | -20.6 | 24.9 | 7 |
| 40100 | 00 | V | 200 | 34/ 35 | 24 | 0 | 4 | -6.3 | 1.8 | 22.7 | 1 |
| 40265 | 00 | V | 150 | 32/ 36 | 25 | 0 | 4 | -3.7 | -0.9 | 16.2 | 1 |
| 41594 | 12 | V | 100 | 32/ 73 | 14 | 0 | 100 | 11.5 | -1.1 | 15.4 | 2 |
| 42027 | 12 | V | 300 | 34/ 75 | 10 | 0 | 100 | 5.6 | 9.6 | 16.9 | 1 |
| 42410 | 00 | V | 150 | 26/ 92 | 11 | 0 | 100 | 13.1 | 8.9 | 24.8 | 3 |
| 42410 | 12 | V | 150 | 26/ 92 | 13 | 0 | 100 | 5.6 | 10.3 | 20.4 | 2 |
| 42724 | 00 | V | 100 | 24/ 91 | 15 | 0 | 100 | 2.7 | -2.5 | 16.7 | 2 |
| 48568 | 12 | V | 150 | 7/ 101 | 21 | 0 | 19 | 8.6 | 6.3 | 16.3 | 1 |
| 60360 | 12 | V | 150 | 37/ 8 | 15 | 1 | 100 | 9.7 | -3.2 | 18.3 | 3 |
| 63741 | 00 | V | 150 | -1/ 37 | 25 | 0 | 100 | 9.6 | 1.7 | 16.4 | 1 |
| 63985 | 00 | V | 150 | -5/ 55 | 18 | 0 | 100 | 8.7 | 4.8 | 17.3 | 2 |
| 63985 | 12 | V | 150 | -5/ 55 | 21 | 0 | 100 | 10.7 | 3.7 | 17.5 | 2 |
| 68174 | 12 | V | 200 | -24/ 29 | 19 | 0 | 100 | -10.8 | 3.6 | 15.7 | 1 |
| 68442 | 12 | V | 200 | -29/ 26 | 12 | 0 | 100 | -16.1 | 4.3 | 22.6 | 3 |
| 68461 | 12 | V | 100 | -28/ 28 | 10 | 1 | 100 | 6.3 | 0.2 | 18.7 | 3 |
| 83612 | 12 | V | 150 | -20/ -55 | 24 | 0 | 100 | -10.9 | -6.9 | 28.9 | 3 |

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. MAY 2002

All hours

Global average number of observations in 24 hours = 1346


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2 2 2 2 1 2 2 2 3 0 1 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 5 6 4 8 4 3 4 2 1 2 1 2 2 5 2 1 2 1
2 2 4 4 6 2 2 4 2 4 6 0 0 0 4 16 31 26 3 15 7 4 4 3 2 5 6 6 4 1 3 4 0 2
6 11 10 10 10 9 9 4 0 0 0 1 11 26 32 16 7 4 1 2 8 6 7 9 16 4 17 0 0
4 10 12 22 17 8 2 0 0 1 1 2 10 11 5 6 14 3 3 0 8 4 12 24 26 25 26 12 0 0
2 1 5 4 10 1 0 0 0 2 1 2 7 8 5 0 6 9 8 20 35 16 4 2 2
2 0 1 4 2 1 7 1 1 3 4 2 0 0 1 8 5 4 8 2 3
0 1 2 0 0 1 1 4 1 19 15 0 4 4 3 2
2 19 0 5 2 5 0 1 1 1 1 1 0 1 1
2 2 4 2 4 1 0 1 1 1 2 2 1 2 5 8 13 1
1 3 2 1 1 5 6 0 2 2 5 1 2 1 11 3 6 10 8 6
2 3 2 0 1 1 1 7 9 8 23 13 6
1 0 2 2 0 7 1 3
0 0 1 0 2 2
0 2 2 2 1 2 1
1 1 0 1

# TABLE 7

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from each unique identifier for radiosonde TEMPs. |
| **Area monitored** | | :90°N - 90°S, 180°W - 180°E. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :00 UTC and 12 UTC. |
| **Level(s) monitored** | | :Standard levels between 500.0 - 150.0 hPa |
| **Element monitored** | | :WIND DIRECTION in degrees |
| **Parameters monitored** | | |
| | :NUM OBS | :Average number of observations at all levels. |
| | :BIAS | :Mean difference of observations from background values from all levels. |
| | :MAX SPREAD | :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels |
| | :SD | :SD of difference of observations from background values at all levels. |

**SELECTION CRITERIA**

:NUM OBS $\geq$ 5, and
ABSOLUTE BIAS $\geq$ 10°, with
SD $<$ 30°, and
MAX SPREAD $<$ 10°

| WMO IDENT | OBS TIME | ELM | LAT/LONG | NUM OBS | BIAS | MAX SPREAD | SD |
|---|---|---|---|---|---|---|---|
| 08594 | 12 | DD | 17/ -23 | 10 | -11.4 | 8.6 | 11.9 |
| 17280 | 12 | DD | 38/ 40 | 24 | -10.7 | 2.9 | 11.7 |
| 29612 | 12 | DD | 55/ 78 | 27 | 21.7 | 6.5 | 10.9 |
| 38341 | 00 | DD | 43/ 71 | 14 | 39.2 | 4.9 | 12.5 |
| 48601 | 00 | DD | 5/ 100 | 16 | 10.7 | 8.2 | 19.4 |
| 59134 | 00 | DD | 24/ 118 | 29 | 10.6 | 2.5 | 10.1 |
| 59134 | 12 | DD | 24/ 118 | 28 | 10.2 | 5.6 | 13.0 |
| 59758 | 12 | DD | 20/ 110 | 21 | 10.3 | 9.2 | 22.2 |
| 60490 | 12 | DD | 36/ -1 | 22 | -12.3 | 6.8 | 21.5 |
| 62337 | 12 | DD | 31/ 34 | 28 | -15.1 | 3.3 | 8.3 |

# MONITORING OF SATELLITE WINDS

## MONITORING CENTRE: BRACKNELL

## MONTH: May 2002

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

**Standard of comparison** :Background field from UKMO global model.

**Selection Criteria** :number of observations > 10.

**Data Extracted** :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

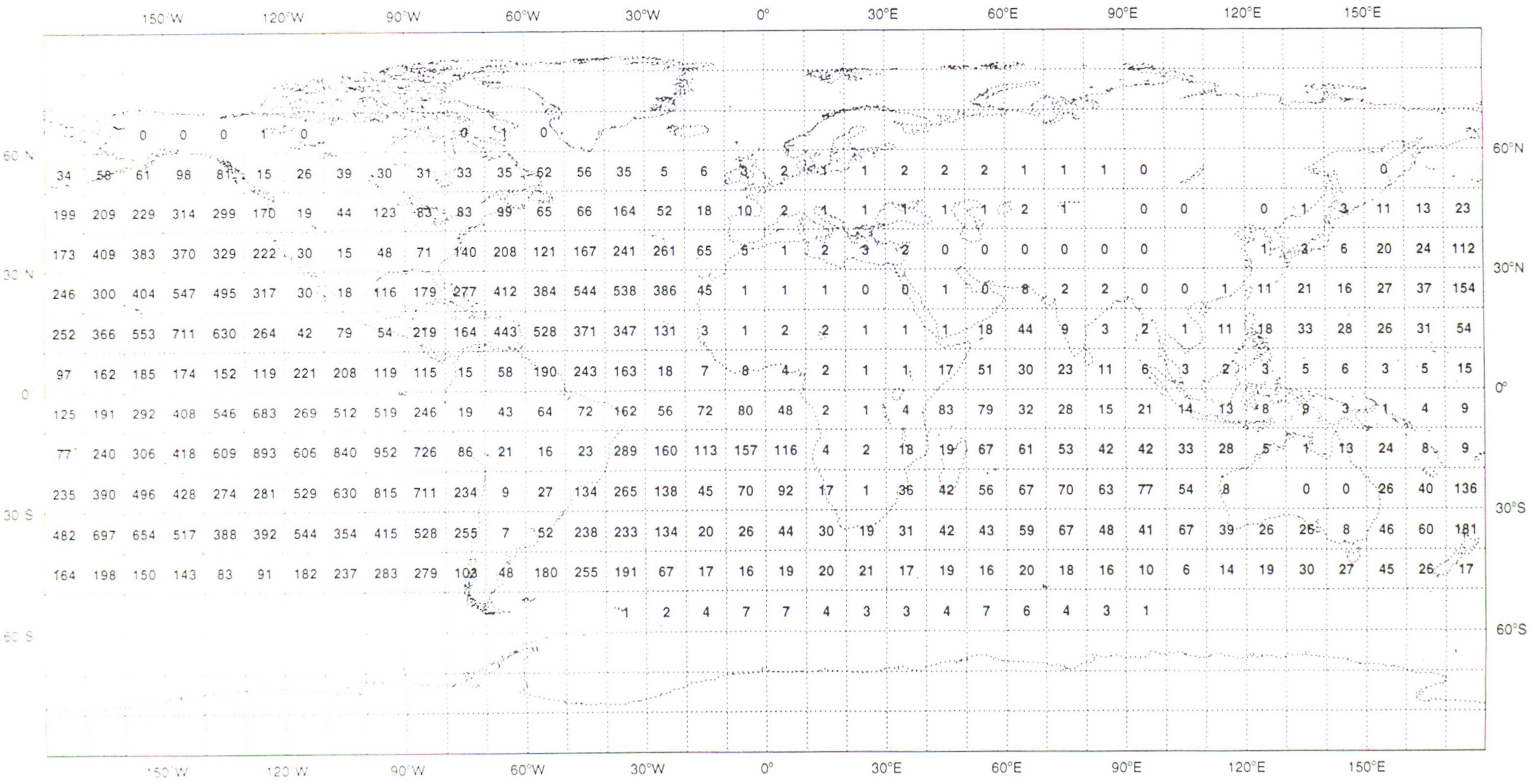
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. MAY 2002
Global average number of observations in 24 hours = 48090



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0 | 0 | 1 | 0 | | | | 0 | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | 58 | 61 | 98 | 81 | 15 | 26 | 39 | 30 | 31 | 33 | 35 | 62 | 56 | 35 | 5 | 6 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | | | | | | 0 | | |
| 199 | 209 | 229 | 314 | 299 | 170 | 19 | 44 | 123 | 83 | 83 | 99 | 65 | 66 | 164 | 52 | 18 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | | 0 | 0 | | 0 | 1 | 3 | 11 | 13 | 23 |
| 173 | 409 | 383 | 370 | 329 | 222 | 30 | 15 | 48 | 71 | 140 | 208 | 121 | 167 | 241 | 261 | 65 | 5 | 1 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | | | 1 | 3 | 6 | 20 | 24 | 112 |
| 246 | 300 | 404 | 547 | 495 | 317 | 30 | 18 | 116 | 179 | 277 | 412 | 384 | 544 | 538 | 386 | 45 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 8 | 2 | 2 | 0 | 0 | 1 | 11 | 21 | 16 | 27 | 37 | 154 |
| 252 | 366 | 553 | 711 | 630 | 264 | 42 | 79 | 54 | 219 | 164 | 443 | 528 | 371 | 347 | 131 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 18 | 44 | 9 | 3 | 2 | 1 | 11 | 18 | 33 | 28 | 26 | 31 | 54 |
| 97 | 162 | 185 | 174 | 152 | 119 | 221 | 208 | 119 | 115 | 15 | 58 | 190 | 243 | 163 | 18 | 7 | 8 | 4 | 2 | 1 | 1 | 17 | 51 | 30 | 23 | 11 | 6 | 3 | 2 | 3 | 5 | 6 | 3 | 5 | 15 |
| 125 | 191 | 292 | 408 | 546 | 683 | 269 | 512 | 519 | 246 | 19 | 43 | 64 | 72 | 162 | 56 | 72 | 80 | 48 | 2 | 1 | 4 | 83 | 79 | 32 | 28 | 15 | 21 | 14 | 13 | 8 | 9 | 3 | 1 | 4 | 9 |
| 77 | 240 | 306 | 418 | 609 | 893 | 606 | 840 | 952 | 726 | 86 | 21 | 16 | 23 | 289 | 160 | 113 | 157 | 116 | 4 | 2 | 18 | 19 | 67 | 61 | 53 | 42 | 42 | 33 | 28 | 5 | 1 | 13 | 24 | 8 | 9 |
| 235 | 390 | 496 | 428 | 274 | 281 | 529 | 630 | 815 | 711 | 234 | 9 | 27 | 134 | 265 | 138 | 45 | 70 | 92 | 17 | 1 | 36 | 42 | 56 | 67 | 70 | 63 | 77 | 54 | 8 | | 0 | 0 | 26 | 40 | 136 |
| 482 | 697 | 654 | 517 | 388 | 392 | 544 | 354 | 415 | 528 | 255 | 7 | 52 | 238 | 233 | 134 | 20 | 26 | 44 | 30 | 19 | 31 | 42 | 43 | 59 | 67 | 48 | 41 | 67 | 39 | 26 | 25 | 8 | 46 | 60 | 181 |
| 164 | 198 | 150 | 143 | 83 | 91 | 182 | 237 | 283 | 279 | 103 | 48 | 180 | 255 | 191 | 67 | 17 | 16 | 19 | 20 | 21 | 17 | 19 | 16 | 20 | 18 | 16 | 10 | 6 | 14 | 19 | 30 | 27 | 45 | 26 | 17 |
| | | | | | | | | | | | | | | 1 | 2 | 4 | 7 | 7 | 4 | 3 | 3 | 4 | 7 | 6 | 4 | 3 | 1 | | | | | | | | |

Figure 11. SATOB 701 - 1000 hPa vector mean wind. MAY 2002

All observations

Arrows are plotted where greater than 10 obs are present

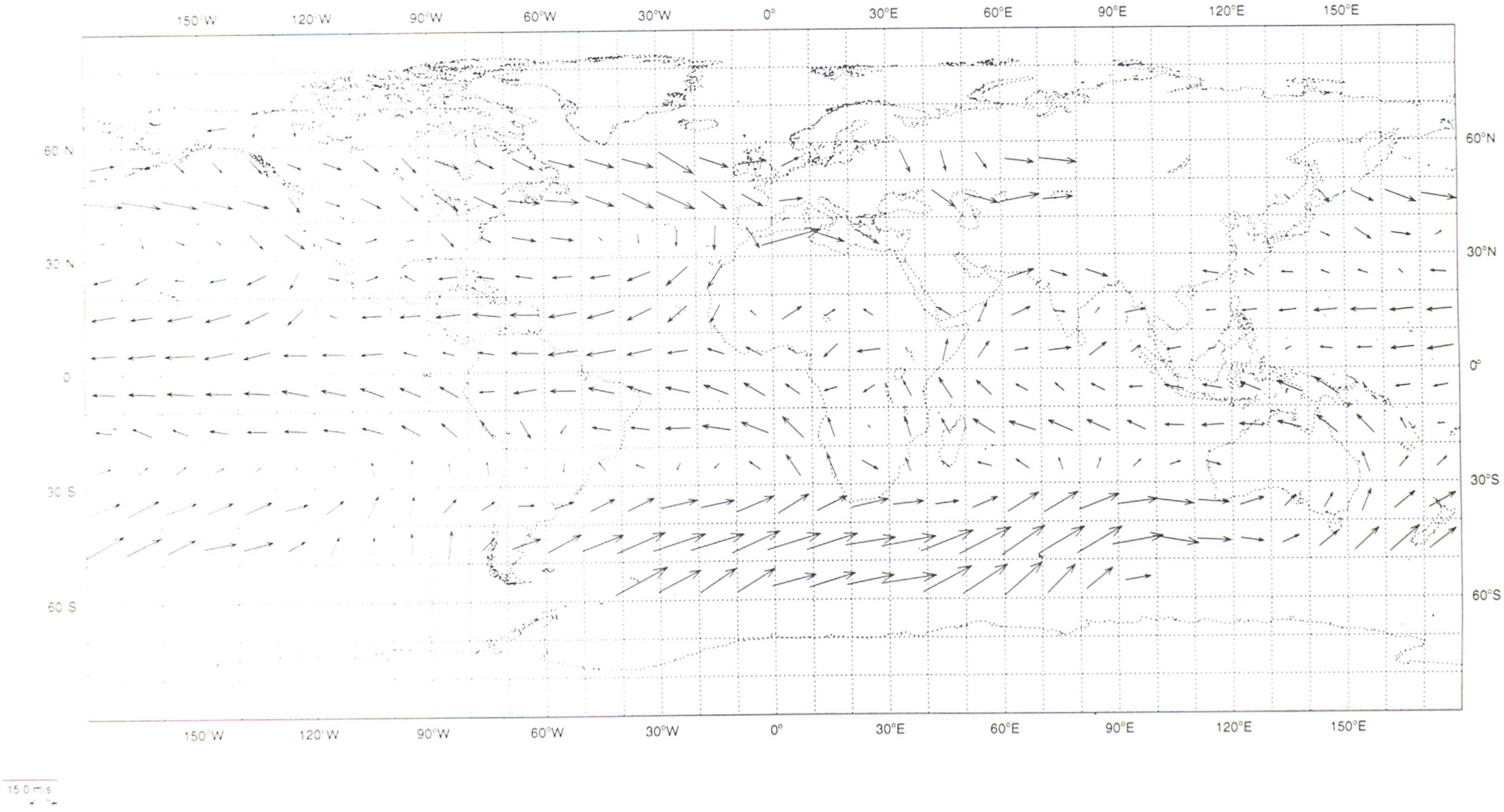

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. MAY 2002
All observations
Arrows are plotted where greater than 10 obs are present

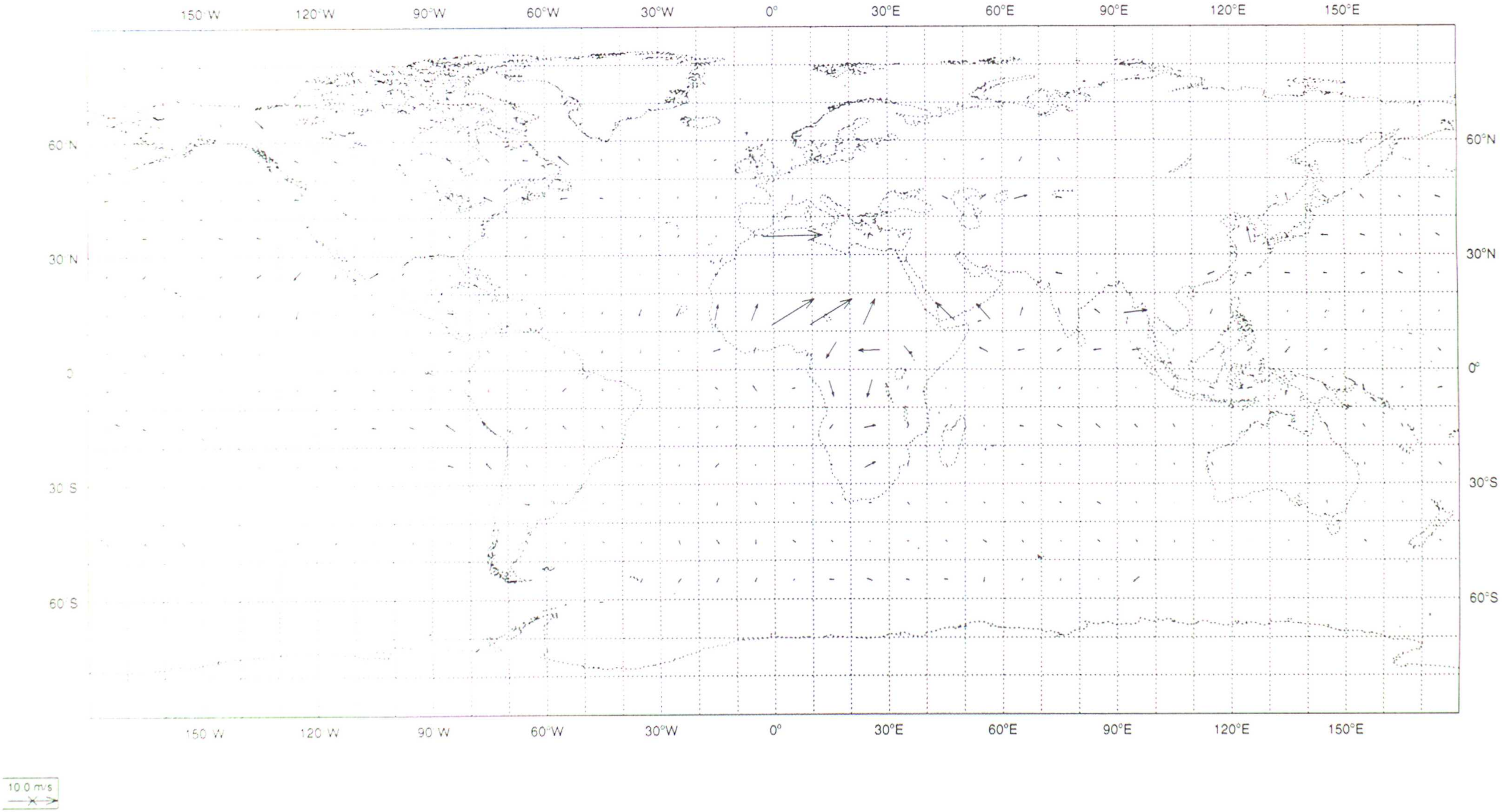

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). MAY 2002

All observations

Values are plotted where greater than 10 obs are present

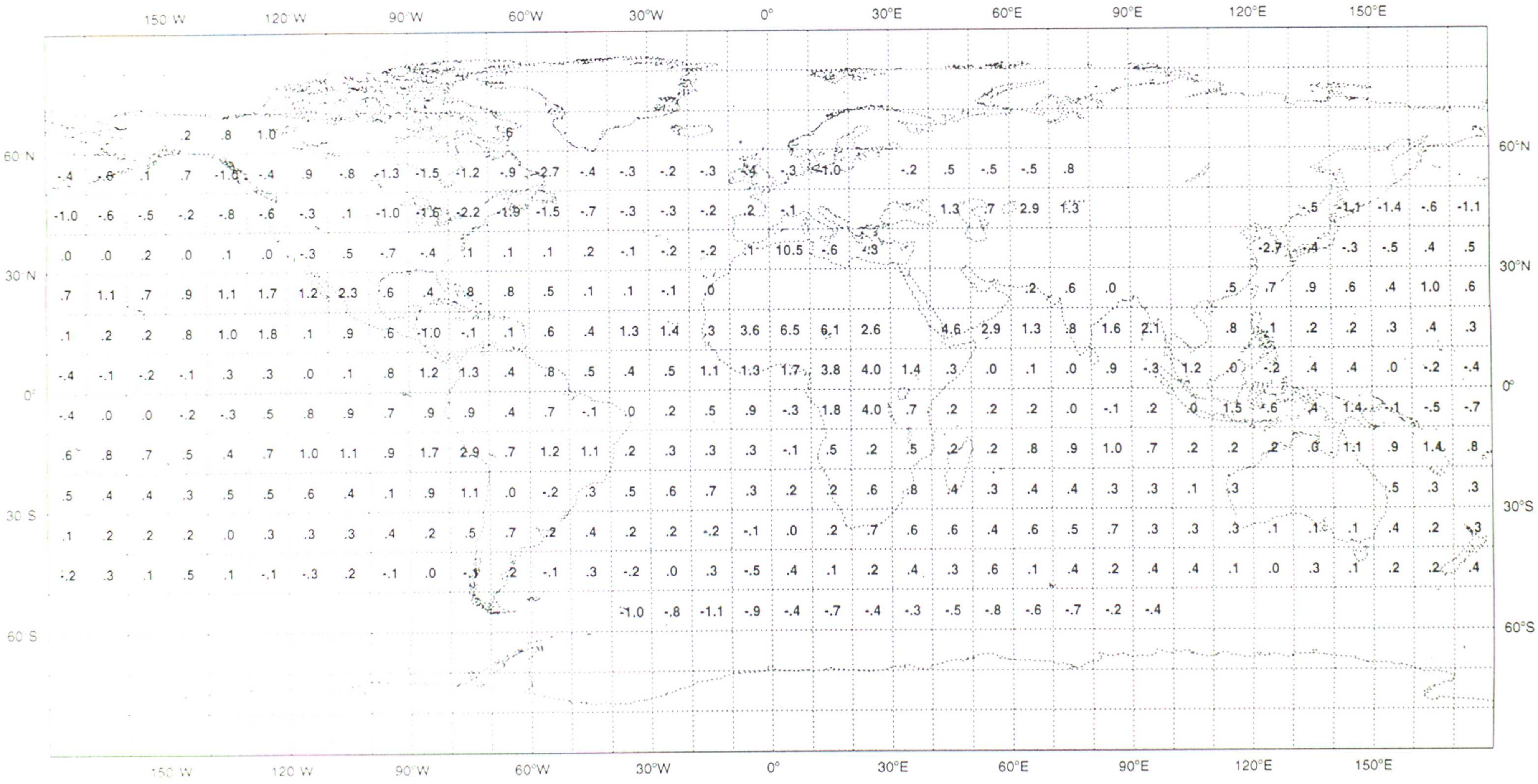

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.2 .8 1.0 .6
-.4 .6 .1 .7 -1.6 -.4 .9 -.8 -1.3 -1.5 -1.2 -.9 -2.7 -.4 -.3 -.2 -.3 -.4 -.3 -1.0 -.2 .5 -.5 -.5 .8
-1.0 -.6 -.5 -.2 -.8 -.6 -.3 .1 -1.0 -1.6 -2.2 -1.9 -1.5 -.7 -.3 -.3 -.2 .2 -.1 1.3 .7 2.9 1.3 -.5 -1.1 -1.4 -.6 -1.1
.0 .0 .2 .0 .1 .0 -.3 .5 -.7 -.4 .1 .1 .1 .2 -.1 -.2 -.2 .1 10.5 -.6 .3 -2.7 -.4 -.3 -.5 .4 .5
.7 1.1 .7 .9 1.1 1.7 1.2 2.3 .6 .4 .8 .8 .5 .1 .1 -.1 .0 .2 .6 .0 .5 .7 .9 .6 .4 1.0 .6
.1 .2 .2 .8 1.0 1.8 .1 .9 .6 -1.0 -.1 .1 .6 .4 1.3 1.4 .3 3.6 6.5 6.1 2.6 4.6 2.9 1.3 .8 1.6 2.1 .8 .1 .2 .2 .3 .4 .3
-.4 -.1 -.2 -.1 .3 .3 .0 .1 .8 1.2 1.3 .4 .8 .5 .4 .5 1.1 1.3 1.7 3.8 4.0 1.4 .3 .0 .1 .0 .9 -.3 1.2 .0 -.2 .4 .4 .0 -.2 -.4
-.4 .0 .0 -.2 -.3 .5 .8 .9 .7 .9 .9 .4 .7 -.1 .0 .2 .5 .9 -.3 1.8 4.0 .7 .2 .2 .2 .0 -.1 .2 .0 1.5 .6 .4 1.4 -.1 -.5 -.7
.6 .8 .7 .5 .4 .7 1.0 1.1 .9 1.7 2.9 .7 1.2 1.1 .2 .3 .3 .3 -.1 .5 .2 .5 .2 .2 .8 .9 1.0 .7 .2 .2 .2 .0 1.1 .9 1.4 .8
.5 .4 .4 .3 .5 .5 .6 .4 .1 .9 1.1 .0 -.2 .3 .5 .6 .7 .3 .2 .2 .6 .8 .4 .3 .4 .4 .3 .3 .1 .3 .5 .3 .3
.1 .2 .2 .2 .0 .3 .3 .3 .4 .2 .5 .7 .2 .4 .2 .2 -.2 -.1 .0 .2 .7 .6 .6 .4 .6 .5 .7 .3 .3 .3 .1 .1 .1 .4 .2 .3
-.2 .3 .1 .5 .1 -.1 -.3 .2 -.1 .0 -.1 .2 -.1 .3 -.2 .0 .3 -.5 .4 .1 .2 .4 .3 .6 .1 .4 .2 .4 .4 .1 .0 .3 .1 .2 .2 .4
-1.0 -.8 -1.1 -.9 -.4 -.7 -.4 -.3 -.5 -.8 -.6 -.7 -.2 -.4

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). MAY 2002

All observations

Values are plotted where greater than 10 obs are present

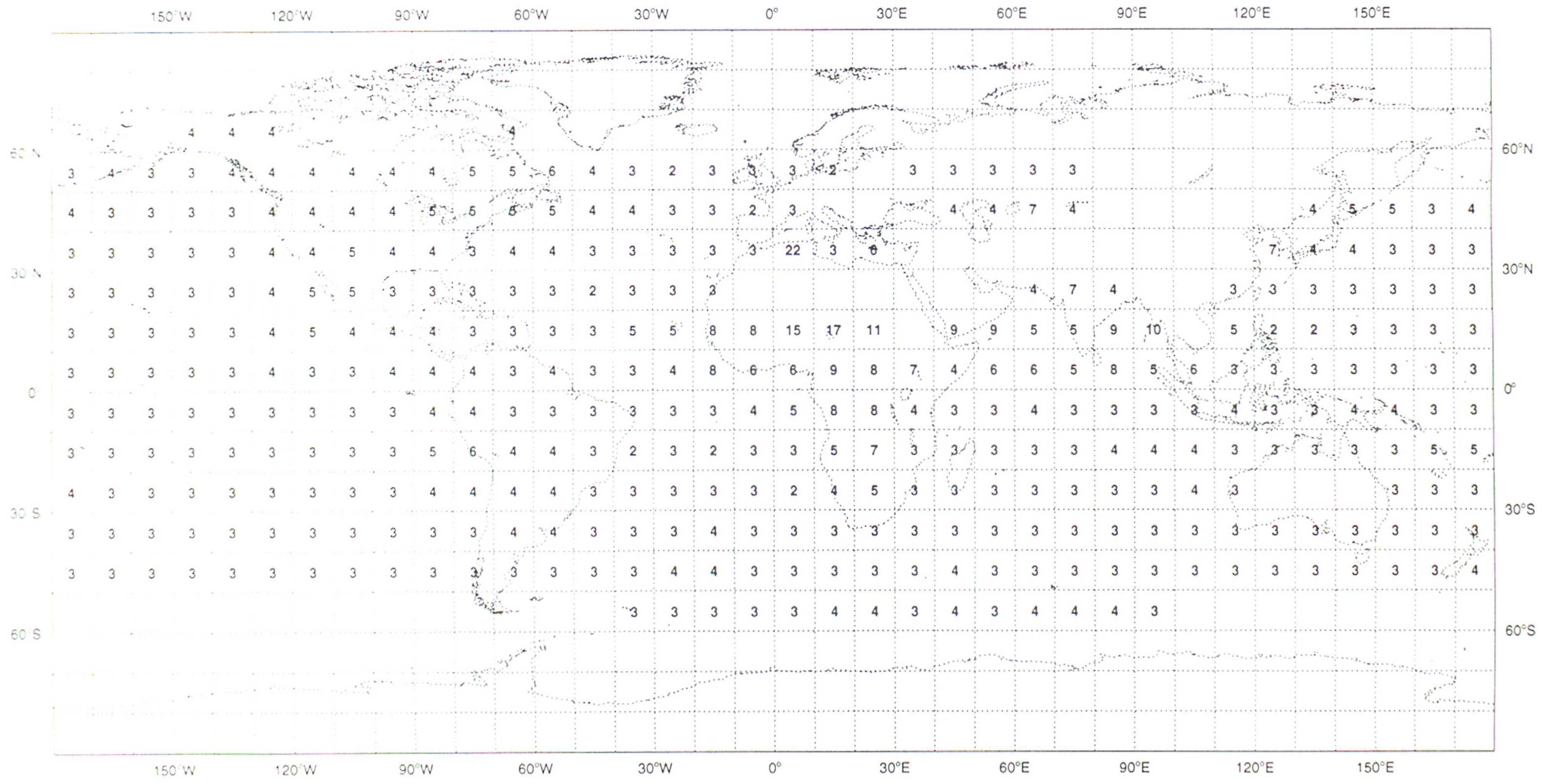
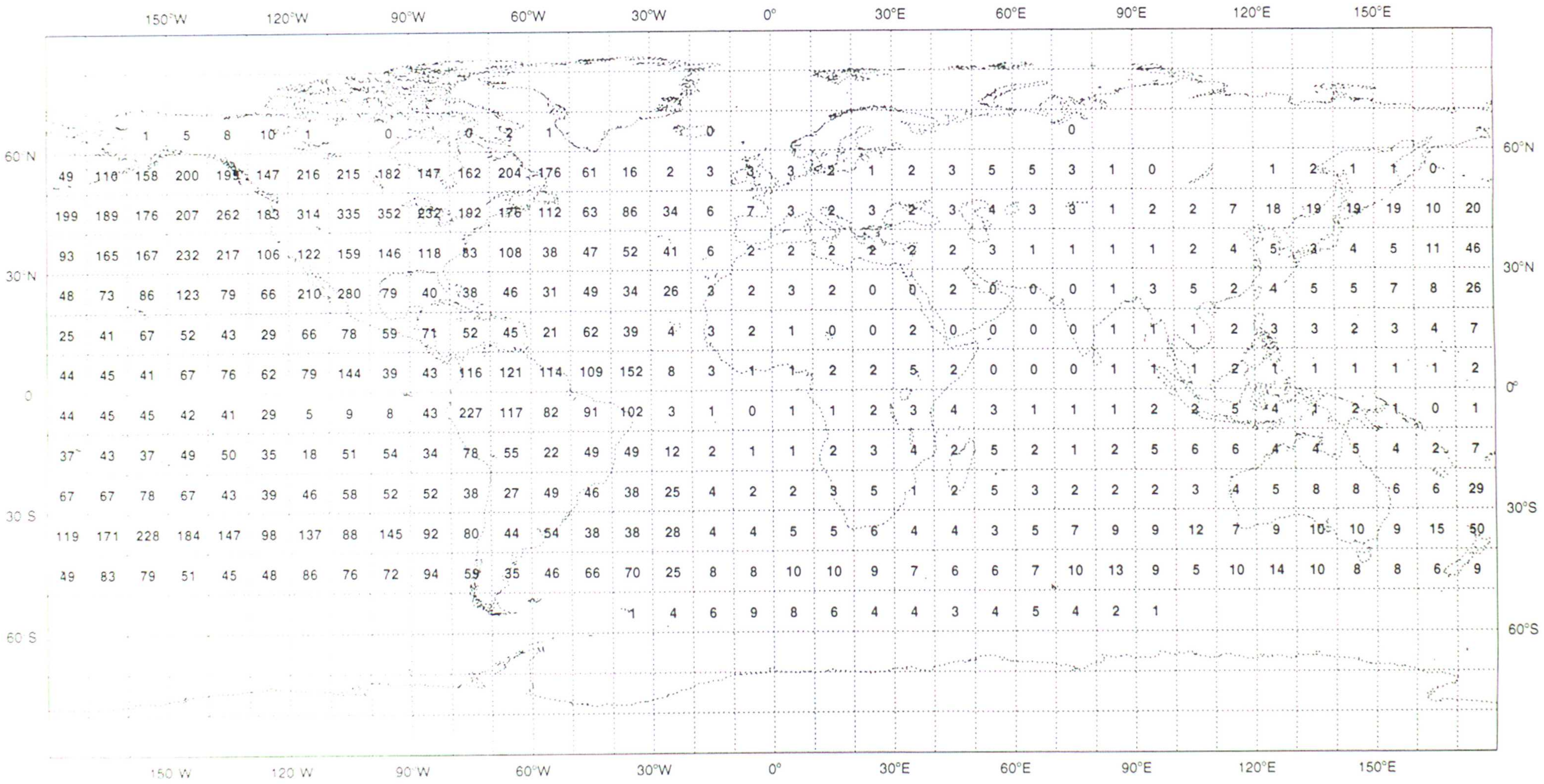

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 4 4 4
3 4 3 3 4 4 4 4 4 4 5 5 6 4 3 2 3 3 3 2 3 3 3 3 3
4 3 3 3 3 4 4 4 4 5 5 5 5 4 4 3 3 2 3 4 4 7 4 4 5 5 3 4
3 3 3 3 3 4 4 5 4 4 3 4 4 3 3 3 3 3 22 3 6 7 4 4 3 3 3
3 3 3 3 3 4 5 5 3 3 3 3 3 2 3 3 3 4 7 4 3 3 3 3 3 3 3
3 3 3 3 3 4 5 4 4 4 3 3 3 3 5 5 8 8 15 17 11 9 9 5 5 9 10 5 2 2 3 3 3 3
3 3 3 3 3 4 3 3 4 4 4 3 4 3 3 4 8 6 6 9 8 7 4 6 6 5 8 5 6 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 4 4 3 3 3 3 3 3 4 5 8 8 4 3 3 4 3 3 3 3 4 3 3 4 4 3 3
3 3 3 3 3 3 3 3 3 5 6 4 4 3 2 3 2 3 3 5 7 3 3 3 3 3 4 4 4 3 3 3 3 3 5 5
4 3 3 3 3 3 3 3 3 4 4 4 4 3 3 3 3 3 2 4 5 3 3 3 3 3 3 3 4 3 3 3 3
3 3 3 3 3 3 3 3 3 3 3 4 4 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 4
3 3 3 3 3 4 4 3 4 3 4 4 4 3

Figure 15. SATOB 401 - 700 hPa mean daily count. MAY 2002
Global average number of observations in 24 hours = 16735



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 5 | 8 | 10 | 1 | | 0 | | 0 | 2 | 1 | | | | 0 | | | | | | | | | 0 | | | | | | | | | | |
| 49 | 116 | 158 | 200 | 195 | 147 | 216 | 215 | 182 | 147 | 162 | 204 | 176 | 61 | 16 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 5 | 5 | 3 | 1 | 0 | | | 1 | 2 | 1 | 1 | 0 | |
| 199 | 189 | 176 | 207 | 262 | 183 | 314 | 335 | 352 | 232 | 192 | 176 | 112 | 63 | 86 | 34 | 6 | 7 | 3 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 1 | 2 | 2 | 7 | 18 | 19 | 19 | 19 | 10 | 20 |
| 93 | 165 | 167 | 232 | 217 | 106 | 122 | 159 | 146 | 118 | 83 | 108 | 38 | 47 | 52 | 41 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 4 | 5 | 3 | 4 | 5 | 11 | 46 |
| 48 | 73 | 86 | 123 | 79 | 66 | 210 | 280 | 79 | 40 | 38 | 46 | 31 | 49 | 34 | 26 | 3 | 2 | 3 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 3 | 5 | 2 | 4 | 5 | 5 | 7 | 8 | 26 |
| 25 | 41 | 67 | 52 | 43 | 29 | 66 | 78 | 59 | 71 | 52 | 45 | 21 | 62 | 39 | 4 | 3 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 3 | 4 | 7 |
| 44 | 45 | 41 | 67 | 76 | 62 | 79 | 144 | 39 | 43 | 116 | 121 | 114 | 109 | 152 | 8 | 3 | 1 | 1 | 2 | 2 | 5 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| 44 | 45 | 45 | 42 | 41 | 29 | 5 | 9 | 8 | 43 | 227 | 117 | 82 | 91 | 102 | 3 | 1 | 0 | 1 | 1 | 2 | 3 | 4 | 3 | 1 | 1 | 1 | 2 | 2 | 5 | 4 | 1 | 2 | 1 | 0 | 1 |
| 37 | 43 | 37 | 49 | 50 | 35 | 18 | 51 | 54 | 34 | 78 | 55 | 22 | 49 | 49 | 12 | 2 | 1 | 1 | 2 | 3 | 4 | 2 | 5 | 2 | 1 | 2 | 5 | 6 | 6 | 4 | 4 | 5 | 4 | 2 | 7 |
| 67 | 67 | 78 | 67 | 43 | 39 | 46 | 58 | 52 | 52 | 38 | 27 | 49 | 46 | 38 | 25 | 4 | 2 | 2 | 3 | 5 | 1 | 2 | 5 | 3 | 2 | 2 | 2 | 3 | 4 | 5 | 8 | 8 | 6 | 6 | 29 |
| 119 | 171 | 228 | 184 | 147 | 98 | 137 | 88 | 145 | 92 | 80 | 44 | 54 | 38 | 38 | 28 | 4 | 4 | 5 | 5 | 6 | 4 | 4 | 3 | 5 | 7 | 9 | 9 | 12 | 7 | 9 | 10 | 10 | 9 | 15 | 50 |
| 49 | 83 | 79 | 51 | 45 | 48 | 86 | 76 | 72 | 94 | 59 | 35 | 46 | 66 | 70 | 25 | 8 | 8 | 10 | 10 | 9 | 7 | 6 | 6 | 7 | 10 | 13 | 9 | 5 | 10 | 14 | 10 | 8 | 8 | 6 | 9 |
| | | | | | | | | | | | | | | 1 | 4 | 6 | 9 | 8 | 6 | 4 | 4 | 3 | 4 | 5 | 4 | 2 | 1 | | | | | | | | |

Figure 16. SATOB 401 - 700 hPa vector mean wind. MAY 2002

All observations

Arrows are plotted where greater than 10 obs are present

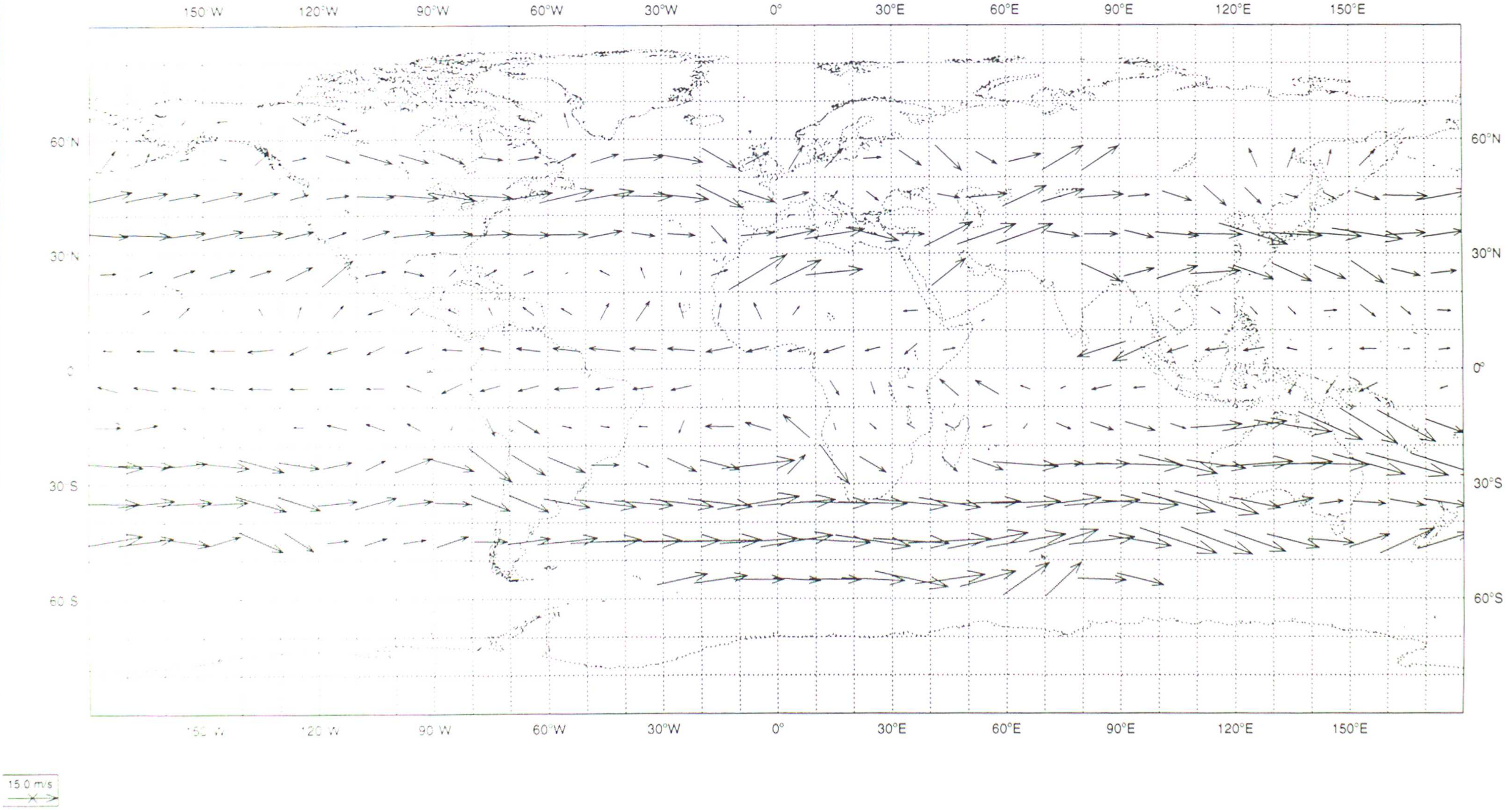

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. MAY 2002
All observations
Arrows are plotted where greater than 10 obs are present

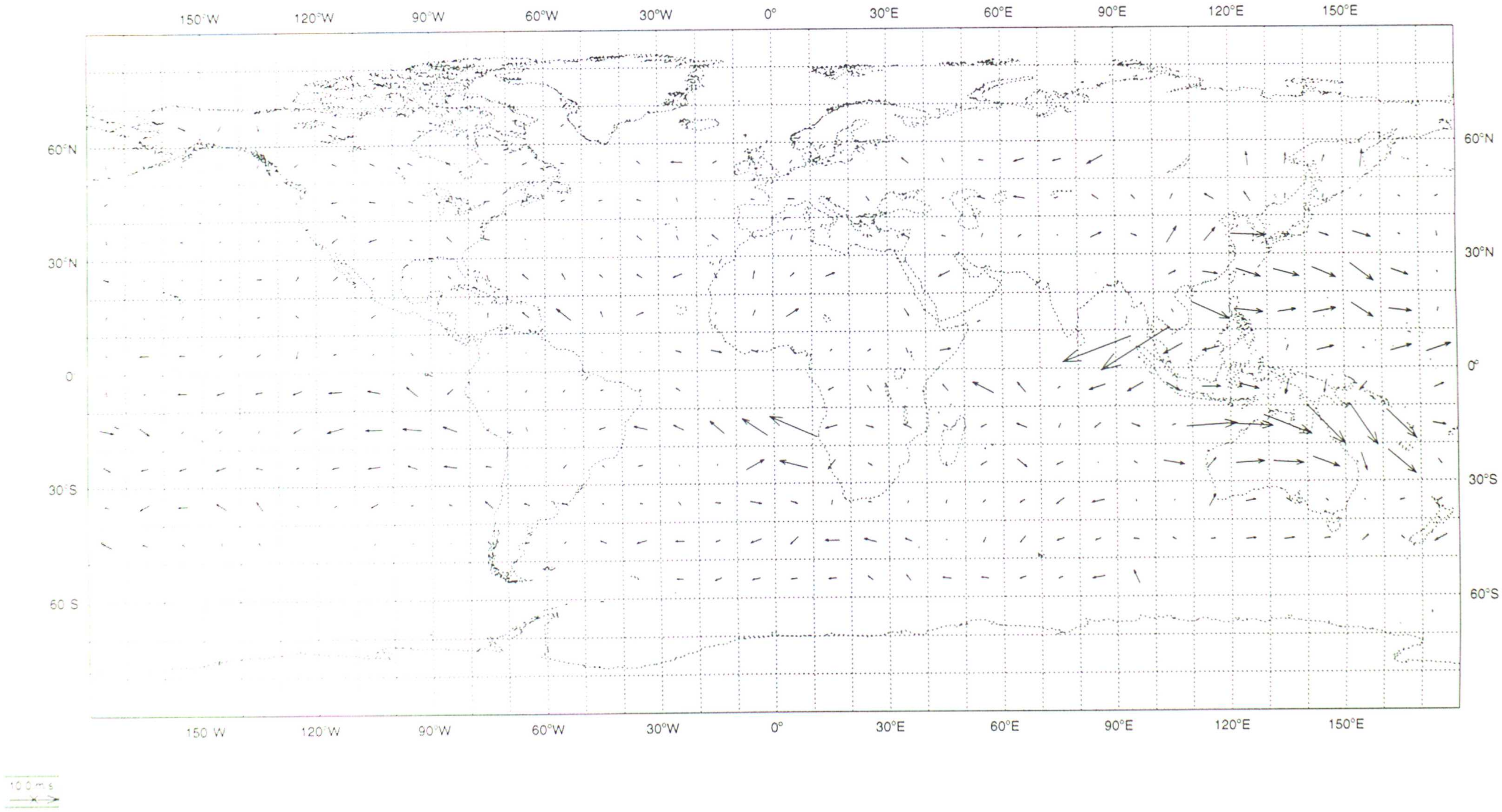

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). MAY 2002

All observations

Values are plotted where greater than 10 obs are present

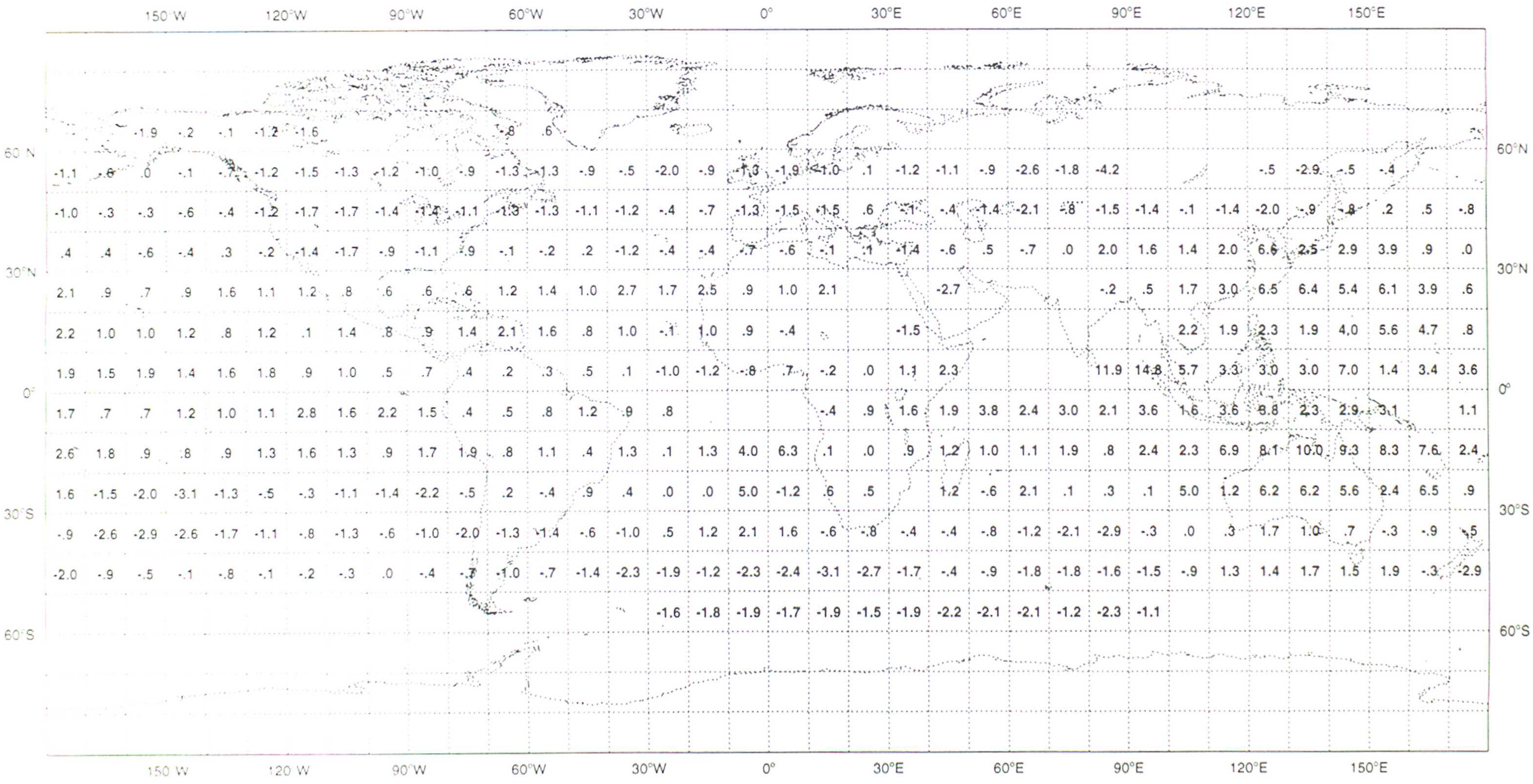

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.9 .2 -.1 -1.2 1.6 .8 .6
-1.1 .6 .0 -.1 -.7 -1.2 -1.5 -1.3 -1.2 -1.0 -.9 -1.3 -1.3 -.9 -.5 -2.0 -.9 -1.3 -1.9 -1.0 .1 -1.2 -1.1 -.9 -2.6 -1.8 -4.2 -.5 -2.9 -.5 -.4
-1.0 -.3 -.3 -.6 -.4 -1.2 -1.7 -1.7 -1.4 -1.4 -1.1 -1.3 -1.3 -1.1 -1.2 -.4 -.7 -1.3 -1.5 -1.5 .6 -.1 -.4 -1.4 -2.1 -.8 -1.5 -1.4 -.1 -1.4 -2.0 -.9 -.8 .2 .5 -.8
.4 .4 -.6 -.4 .3 -.2 -1.4 -1.7 -.9 -1.1 -.9 -.1 -.2 .2 -1.2 -.4 -.4 -.7 -.6 -.1 .1 -1.4 -.6 .5 -.7 .0 2.0 1.6 1.4 2.0 6.6 2.5 2.9 3.9 .9 .0
2.1 .9 .7 .9 1.6 1.1 1.2 .8 .6 .6 .6 1.2 1.4 1.0 2.7 1.7 2.5 .9 1.0 2.1 -2.7 -.2 .5 1.7 3.0 6.5 6.4 5.4 6.1 3.9 .6
2.2 1.0 1.0 1.2 .8 1.2 .1 1.4 .8 .9 1.4 2.1 1.6 .8 1.0 -.1 1.0 .9 -.4 -1.5 2.2 1.9 2.3 1.9 4.0 5.6 4.7 .8
1.9 1.5 1.9 1.4 1.6 1.8 .9 1.0 .5 .7 .4 .2 .3 .5 .1 -1.0 -1.2 -.8 .7 -.2 .0 1.1 2.3 11.9 14.8 5.7 3.3 3.0 3.0 7.0 1.4 3.4 3.6
1.7 .7 .7 1.2 1.0 1.1 2.8 1.6 2.2 1.5 .4 .5 .8 1.2 .9 .8 -.4 .9 1.6 1.9 3.8 2.4 3.0 2.1 3.6 1.6 3.6 8.8 2.3 2.9 3.1 1.1
2.6 1.8 .9 .8 .9 1.3 1.6 1.3 .9 1.7 1.9 .8 1.1 .4 1.3 .1 1.3 4.0 6.3 .1 .0 .9 1.2 1.0 1.1 1.9 .8 2.4 2.3 6.9 8.1 10.0 9.3 8.3 7.6 2.4
1.6 -1.5 -2.0 -3.1 -1.3 -.5 -.3 -1.1 -1.4 -2.2 -.5 .2 -.4 .9 .4 .0 .0 5.0 -1.2 .6 .5 1.2 -.6 2.1 .1 .3 .1 5.0 1.2 6.2 6.2 5.6 2.4 6.5 .9
-.9 -2.6 -2.9 -2.6 -1.7 -1.1 -.8 -1.3 -.6 -1.0 -2.0 -1.3 -1.4 -.6 -1.0 .5 1.2 2.1 1.6 -.6 -.8 -.4 -.4 -.8 -1.2 -2.1 -2.9 -.3 .0 .3 1.7 1.0 .7 -.3 -.9 .5
-2.0 -.9 -.5 -.1 -.8 -.1 -.2 -.3 .0 -.4 -.7 -1.0 -.7 -1.4 -2.3 -1.9 -1.2 -2.3 -2.4 -3.1 -2.7 -1.7 -.4 -.9 -1.8 -1.8 -1.6 -1.5 -.9 1.3 1.4 1.7 1.5 1.9 -.3 -2.9
-1.6 -1.8 -1.9 -1.7 -1.9 -1.5 -1.9 -2.2 -2.1 -2.1 -1.2 -2.3 -1.1

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). MAY 2002
All observations
Values are plotted where greater than 10 obs are present

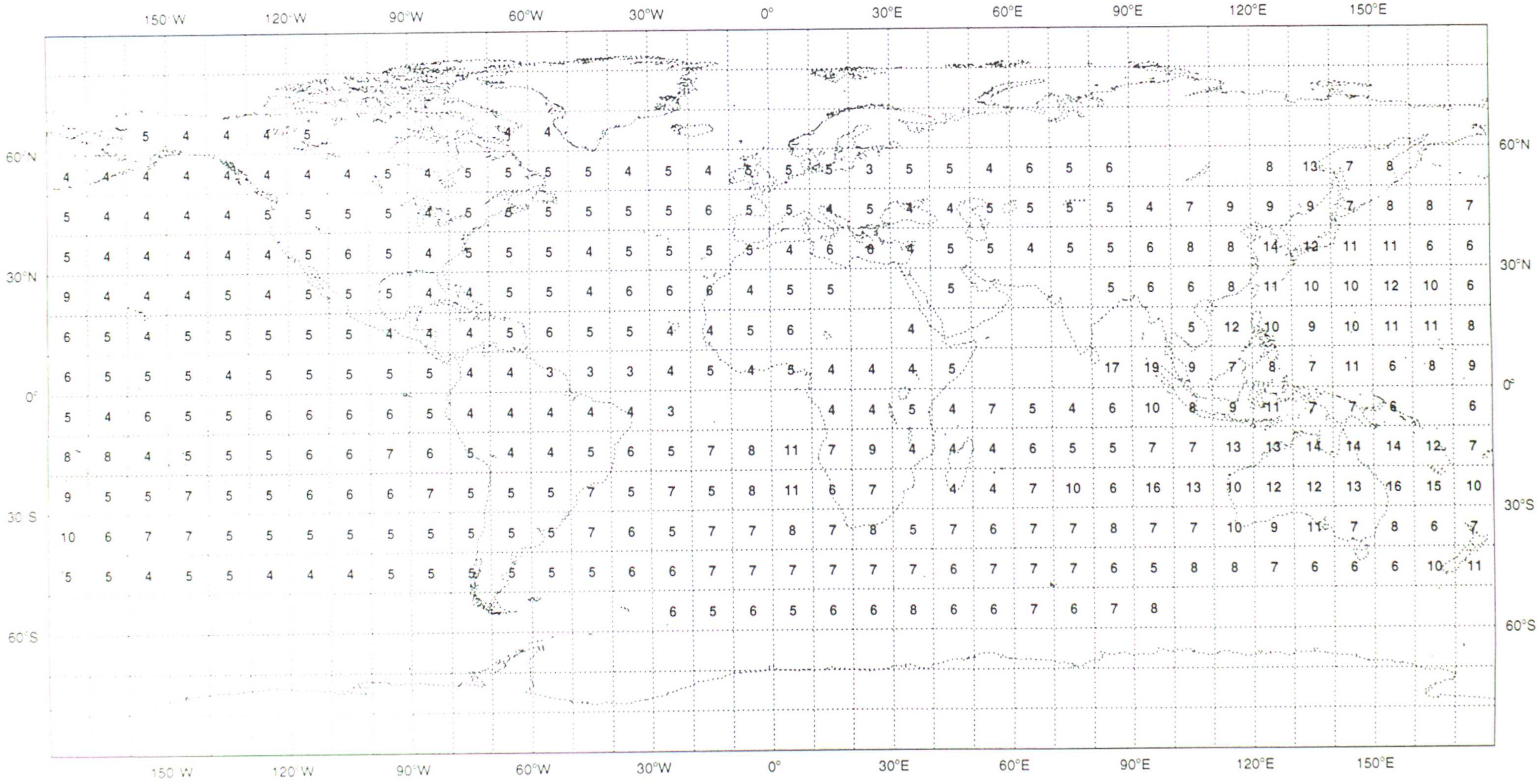

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5 4 4 4 5 4 4
4 4 4 4 4 4 4 4 5 4 5 5 5 5 4 5 4 5 5 5 3 5 5 4 6 5 6 8 13 7 8
5 4 4 4 4 5 5 5 5 4 5 6 5 5 5 5 6 5 5 4 5 4 4 5 5 5 5 4 7 9 9 9 7 8 8 7
5 4 4 4 4 4 5 6 5 4 5 5 5 4 5 5 5 5 4 6 6 4 5 5 4 5 5 6 8 8 14 12 11 11 6 6
9 4 4 4 5 4 5 5 5 4 4 5 5 4 6 6 6 4 5 5 5 5 6 6 8 11 10 10 12 10 6
6 5 4 5 5 5 5 5 4 4 4 5 6 5 5 4 4 5 6 4 5 12 10 9 10 11 11 8
6 5 5 5 4 5 5 5 5 5 4 4 3 3 3 4 5 4 5 4 4 4 5 17 19 9 7 8 7 11 6 8 9
5 4 6 5 5 6 6 6 6 5 4 4 4 4 4 3 4 4 5 4 7 5 4 6 10 8 9 11 7 7 6 6
8 8 4 5 5 5 6 6 7 6 5 4 4 5 6 5 7 8 11 7 9 4 4 4 6 5 5 7 7 13 13 14 14 14 12 7
9 5 5 7 5 5 6 6 6 7 5 5 5 7 5 7 5 8 11 6 7 4 4 7 10 6 16 13 10 12 12 13 16 15 10
10 6 7 7 5 5 5 5 5 5 5 5 5 7 6 5 7 7 8 7 8 5 7 6 7 7 8 7 7 10 9 11 7 8 6 7
5 5 4 5 5 4 4 4 5 5 5 5 5 5 6 6 7 7 7 7 7 7 6 7 7 7 6 5 8 8 7 6 6 6 10 11
6 5 6 5 6 6 8 6 6 7 6 7 8

Figure 20. SATOB 101 - 400 hPa mean daily count. MAY 2002
Global average number of observations in 24 hours = 80071

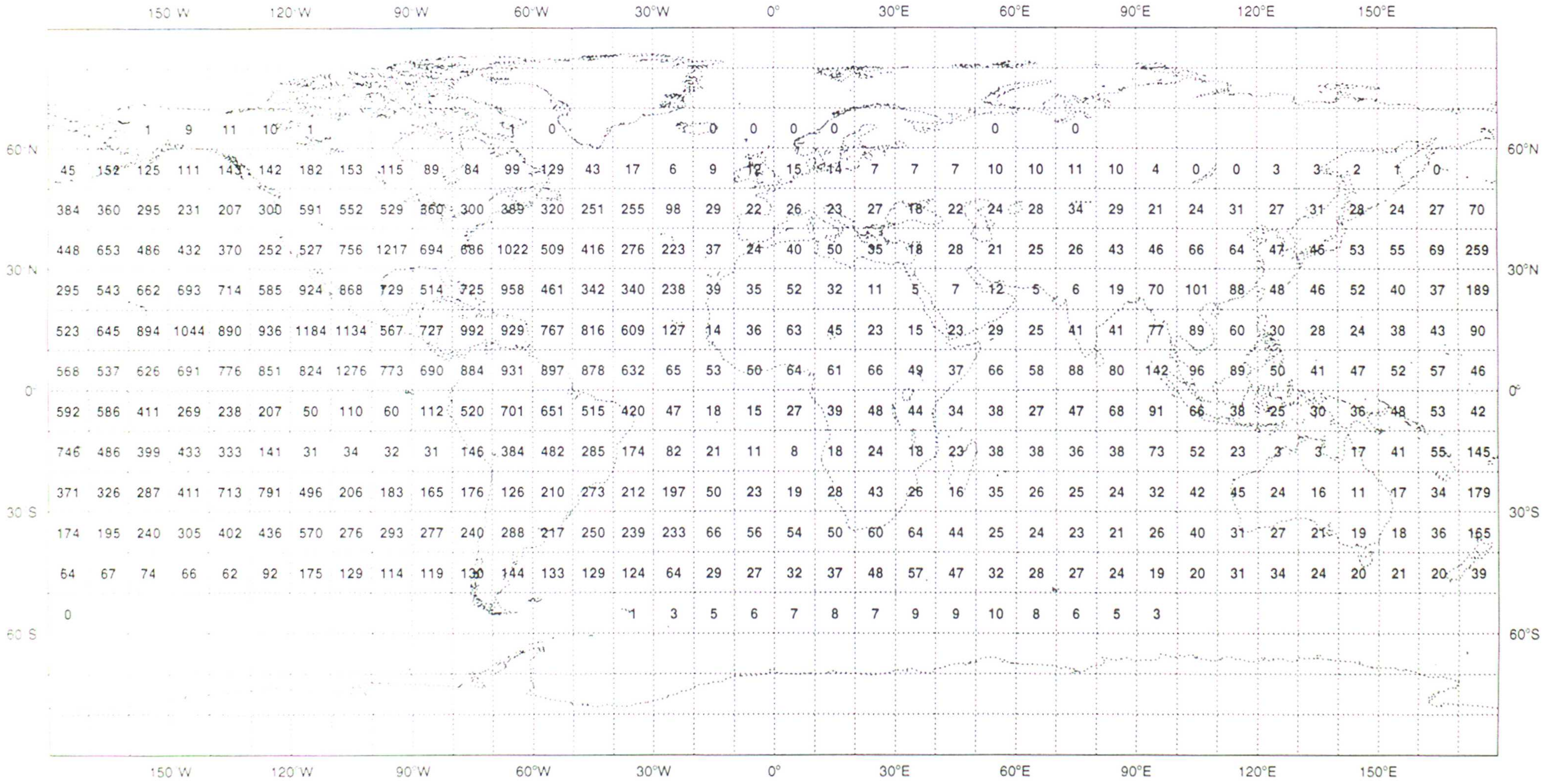

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1 9 11 10 1 1 0 0 0 0 0 0 0
45 152 125 111 143 142 182 153 115 89 84 99 129 43 17 6 9 12 15 14 7 7 7 10 10 11 10 4 0 0 3 3 2 1 0
384 360 295 231 207 300 591 552 529 360 300 389 320 251 255 98 29 22 26 23 27 18 22 24 28 34 29 21 24 31 27 31 28 24 27 70
448 653 486 432 370 252 527 756 1217 694 686 1022 509 416 276 223 37 24 40 50 35 18 28 21 25 26 43 46 66 64 47 46 53 55 69 259
295 543 662 693 714 585 924 868 729 514 725 958 461 342 340 238 39 35 52 32 11 5 7 12 5 6 19 70 101 88 48 46 52 40 37 189
523 645 894 1044 890 936 1184 1134 567 727 992 929 767 816 609 127 14 36 63 45 23 15 23 29 25 41 41 77 89 60 30 28 24 38 43 90
568 537 626 691 776 851 824 1276 773 690 884 931 897 878 632 65 53 50 64 61 66 49 37 66 58 88 80 142 96 89 50 41 47 52 57 46
592 586 411 269 238 207 50 110 60 112 520 701 651 515 420 47 18 15 27 39 48 44 34 38 27 47 68 91 66 38 25 30 36 48 53 42
746 486 399 433 333 141 31 34 32 31 146 384 482 285 174 82 21 11 8 18 24 18 23 38 38 36 38 73 52 23 3 3 17 41 55 145
371 326 287 411 713 791 496 206 183 165 176 126 210 273 212 197 50 23 19 28 43 26 16 35 26 25 24 32 42 45 24 16 11 17 34 179
174 195 240 305 402 436 570 276 293 277 240 288 217 250 239 233 66 56 54 50 60 64 44 25 24 23 21 26 40 31 27 21 19 18 36 165
64 67 74 66 62 92 175 129 114 119 130 144 133 129 124 64 29 27 32 37 48 57 47 32 28 27 24 19 20 31 34 24 20 21 20 39
0 1 3 5 6 7 8 7 9 9 10 8 6 5 3

Figure 21. SATOB 101 - 400 hPa vector mean wind. MAY 2002
All observations
Arrows are plotted where greater than 10 obs are present

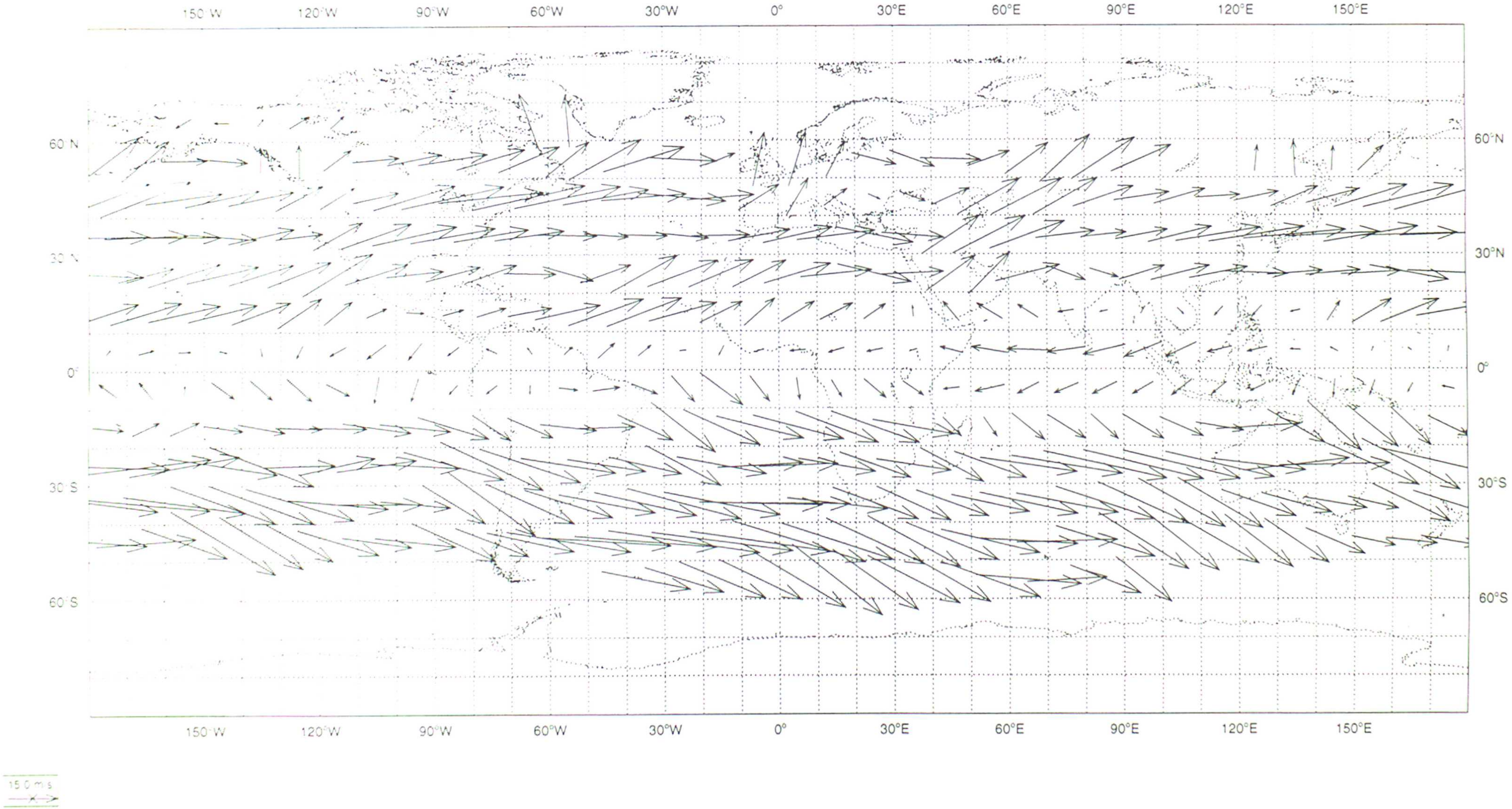

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. MAY 2002

All observations

Arrows are plotted where greater than 10 obs are present

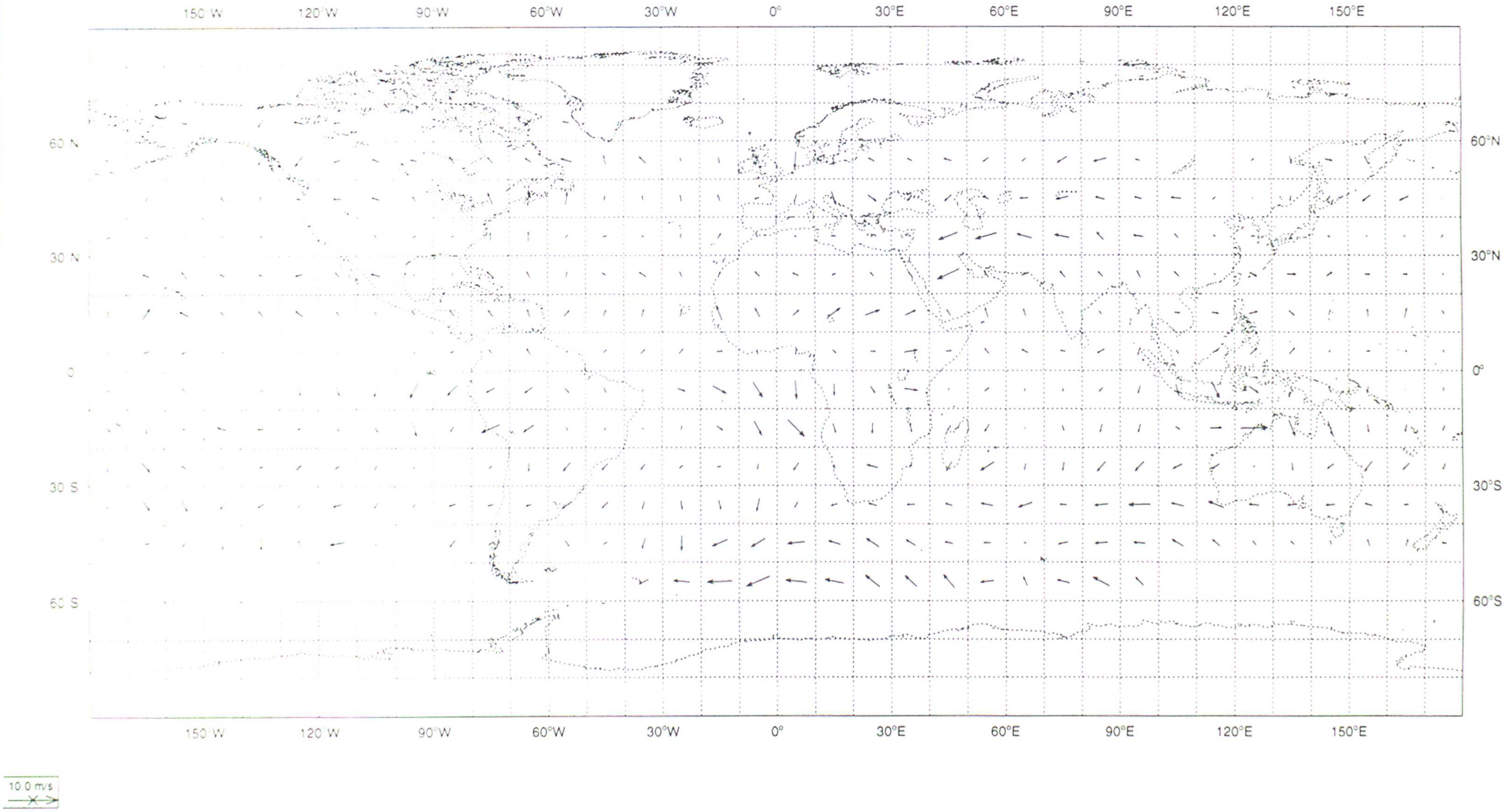

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). MAY 2002

All observations

Values are plotted where greater than 10 obs are present

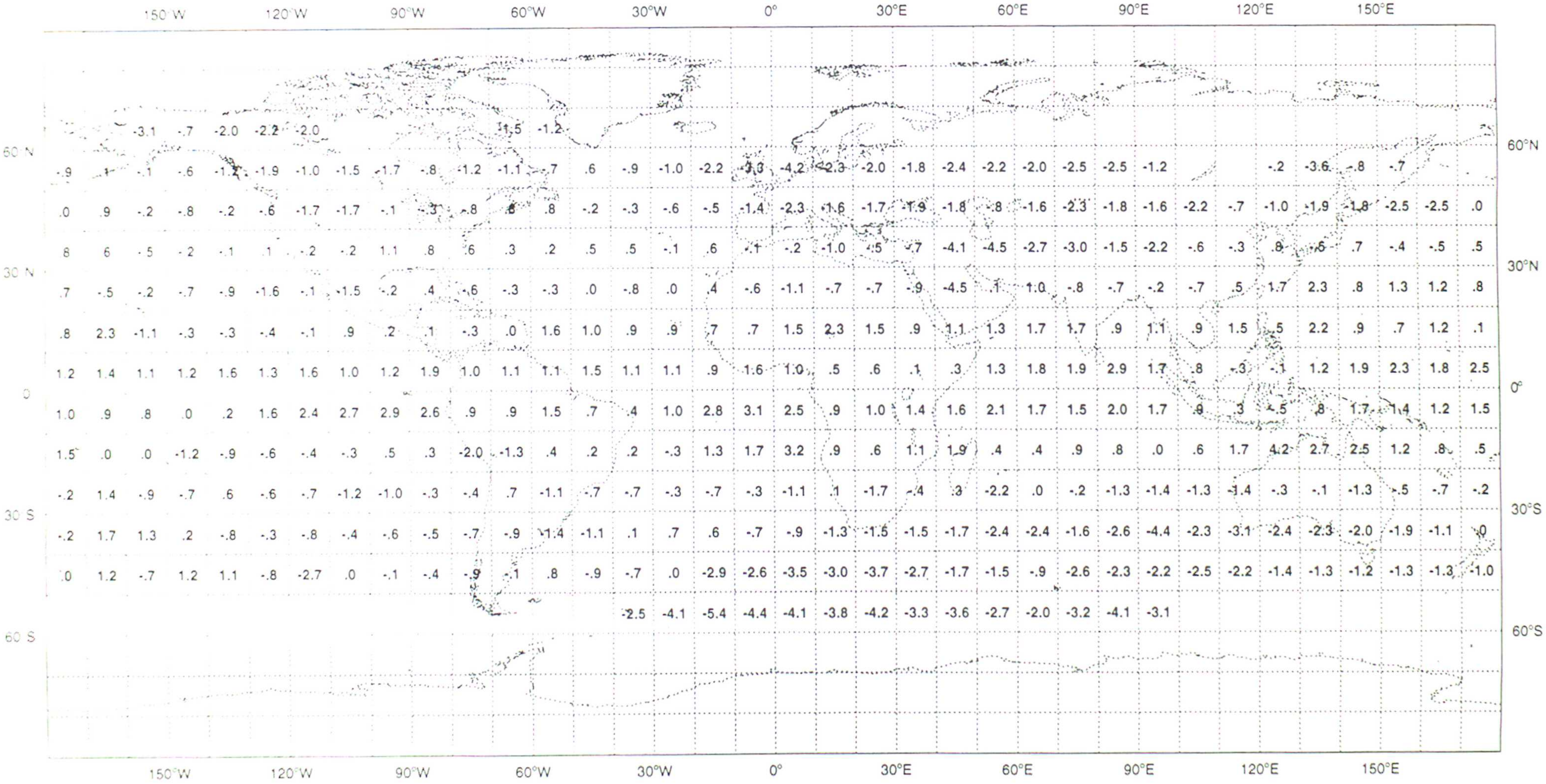
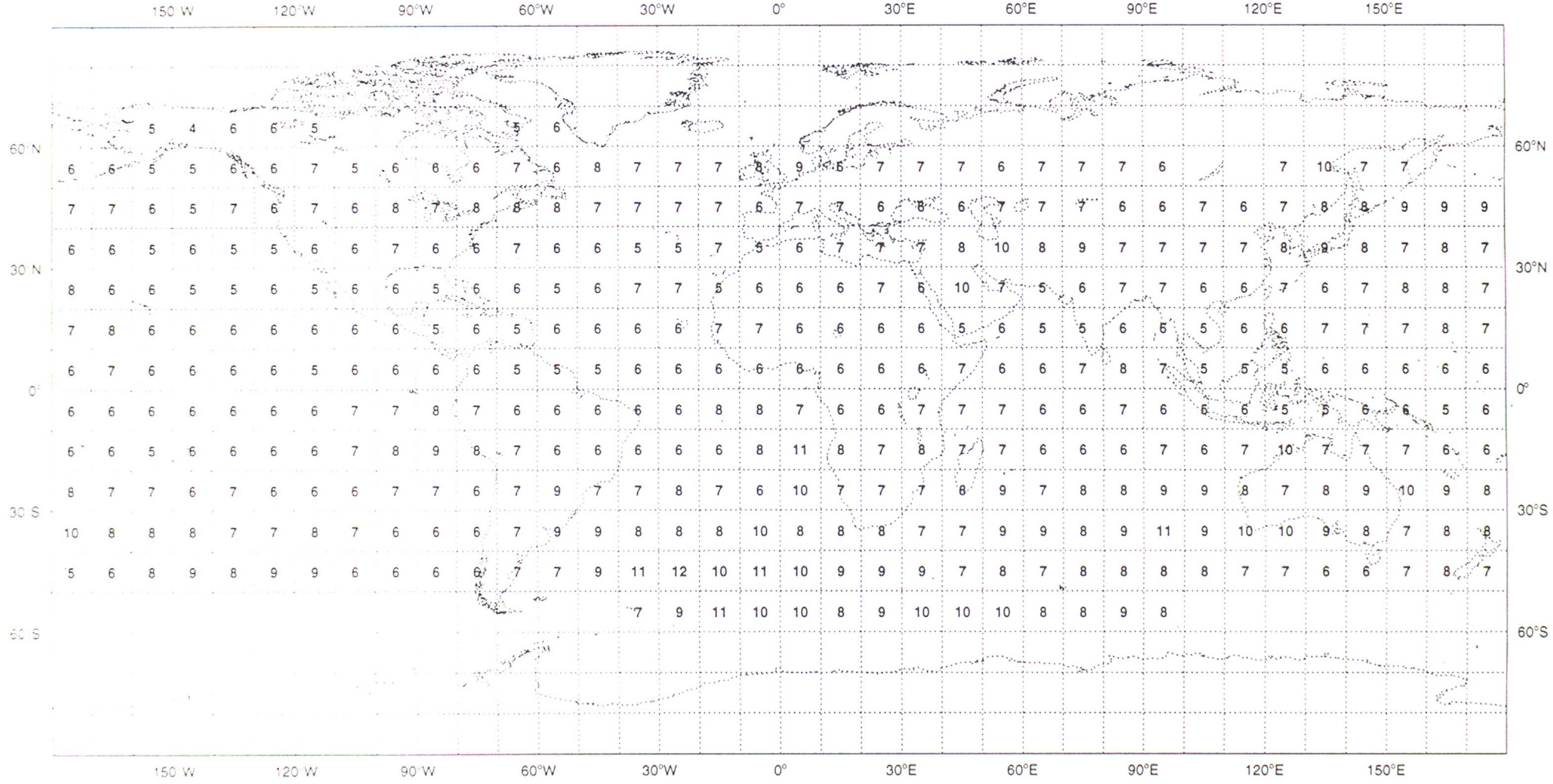

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-3.1 -.7 -2.0 -2.2 -2.0 1.5 -1.2
-.9 -.1 -.1 -.6 -1.7 -1.9 -1.0 -1.5 -1.7 -.8 -1.2 -1.1 -.7 .6 -.9 -1.0 -2.2 -3.3 -4.2 -2.3 -2.0 -1.8 -2.4 -2.2 -2.0 -2.5 -2.5 -1.2 -.2 -3.6 -.8 -.7
.0 .9 -.2 -.8 -.2 -.6 -1.7 -1.7 -.1 -.3 -.8 .8 .8 -.2 -.3 -.6 -.5 -1.4 -2.3 -1.6 -1.7 -1.9 -1.8 -.8 -1.6 -2.3 -1.8 -1.6 -2.2 -.7 -1.0 -1.9 -1.8 -2.5 -2.5 .0
.8 .6 -.5 -.2 -.1 .1 -.2 -.2 1.1 .8 .6 .3 .2 .5 .5 -.1 .6 -.1 -.2 -1.0 .5 -.7 -4.1 -4.5 -2.7 -3.0 -1.5 -2.2 -.6 -.3 .8 -.5 .7 -.4 -.5 .5
.7 -.5 -.2 -.7 -.9 -1.6 -.1 -1.5 -.2 .4 -.6 -.3 -.3 .0 -.8 .0 .4 -.6 -1.1 -.7 -.7 -.9 -4.5 .1 1.0 -.8 -.7 -.2 -.7 .5 1.7 2.3 .8 1.3 1.2 .8
.8 2.3 -1.1 -.3 -.3 -.4 -.1 .9 .2 .1 -.3 .0 1.6 1.0 .9 .9 .7 .7 1.5 2.3 1.5 .9 1.1 1.3 1.7 1.7 .9 1.1 .9 1.5 .5 2.2 .9 .7 1.2 .1
1.2 1.4 1.1 1.2 1.6 1.3 1.6 1.0 1.2 1.9 1.0 1.1 1.1 1.5 1.1 1.1 .9 1.6 1.0 .5 .6 .1 .3 1.3 1.8 1.9 2.9 1.7 .8 -.3 -.1 1.2 1.9 2.3 1.8 2.5
1.0 .9 .8 .0 .2 1.6 2.4 2.7 2.9 2.6 .9 .9 1.5 .7 .4 1.0 2.8 3.1 2.5 .9 1.0 1.4 1.6 2.1 1.7 1.5 2.0 1.7 .9 .3 .5 .8 1.7 1.4 1.2 1.5
1.5 .0 .0 -1.2 -.9 -.6 -.4 -.3 .5 .3 -2.0 -1.3 .4 .2 .2 -.3 1.3 1.7 3.2 .9 .6 1.1 1.9 .4 .4 .9 .8 .0 .6 1.7 4.2 2.7 2.5 1.2 .8 .5
-.2 1.4 -.9 -.7 .6 -.6 -.7 -1.2 -1.0 -.3 -.4 .7 -1.1 -.7 -.7 -.3 -.7 -.3 -1.1 .1 -1.7 -.4 .3 -2.2 .0 -.2 -1.3 -1.4 -1.3 -1.4 -.3 -.1 -1.3 -.5 -.7 -.2
-.2 1.7 1.3 .2 -.8 -.3 -.8 -.4 -.6 -.5 -.7 -.9 -1.4 -1.1 .1 .7 .6 -.7 -.9 -1.3 -1.5 -1.5 -1.7 -2.4 -2.4 -1.6 -2.6 -4.4 -2.3 -3.1 -2.4 -2.3 -2.0 -1.9 -1.1 .0
.0 1.2 -.7 1.2 1.1 -.8 -2.7 .0 -.1 -.4 -.9 -.1 .8 -.9 -.7 .0 -2.9 -2.6 -3.5 -3.0 -3.7 -2.7 -1.7 -1.5 -.9 -2.6 -2.3 -2.2 -2.5 -2.2 -1.4 -1.3 -1.2 -1.3 -1.3 -1.0
-2.5 -4.1 -5.4 -4.4 -4.1 -3.8 -4.2 -3.3 -3.6 -2.7 -2.0 -3.2 -4.1 -3.1

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). MAY 2002

All observations

Values are plotted where greater than 10 obs are present


150 W
120 W
90 W
60 W
30 W
0°
30°E
60°E
90°E
120°E
150°E
60 N
30 N
0°
30 S
60 S
5 4 6 6 5 5 6
6 6 5 5 6 6 7 5 6 6 6 7 6 8 7 7 7 8 9 5 7 7 7 6 7 7 7 6 7 10 7 7
7 7 6 5 7 6 7 6 8 7 8 8 8 7 7 7 7 6 7 7 6 8 6 7 7 7 6 6 7 6 7 8 8 9 9 9
6 6 5 6 5 5 6 6 7 6 6 7 6 6 5 5 7 5 6 7 7 7 8 10 8 9 7 7 7 7 8 9 8 7 8 7
8 6 6 5 5 6 5 6 6 5 6 6 5 6 7 7 5 6 6 6 7 6 10 7 5 6 7 7 6 6 7 6 7 8 8 7
7 8 6 6 6 6 6 6 6 5 6 5 6 6 6 6 7 7 6 6 6 6 5 6 5 5 6 6 5 6 6 7 7 7 8 7
6 7 6 6 6 6 5 6 6 6 6 5 5 5 6 6 6 6 6 6 6 6 7 6 6 7 8 7 5 5 5 6 6 6 6 6
6 6 6 6 6 6 6 7 7 8 7 6 6 6 6 6 8 8 7 6 6 7 7 7 6 6 7 6 6 6 5 5 6 6 5 6
6 6 5 6 6 6 6 7 8 9 8 7 6 6 6 6 6 8 11 8 7 8 7 7 6 6 6 7 6 7 10 7 7 7 6 6
8 7 7 6 7 6 6 6 7 7 6 7 9 7 7 8 7 6 10 7 7 7 8 9 7 8 8 9 9 8 7 8 9 10 9 8
10 8 8 8 7 7 8 7 6 6 6 7 9 9 8 8 8 10 8 8 8 7 7 9 9 8 9 11 9 10 10 9 8 7 8 8
5 6 8 9 8 9 9 6 6 6 6 7 7 9 11 12 10 11 10 9 9 9 7 8 7 8 8 8 8 7 7 6 6 7 8 7
7 9 11 10 10 8 9 10 10 10 8 8 9 8

# MONITORING OF SATELLITE TEMPERATURES

## MONITORING CENTRE: BRACKNELL

## MONTH: May 2002

### Monitoring procedures

**Period** :One calendar month.

**Data monitored** :Reports from NOAA-15 and NOAA-16.

**Standard of comparison** :Background field from UKMO global model.

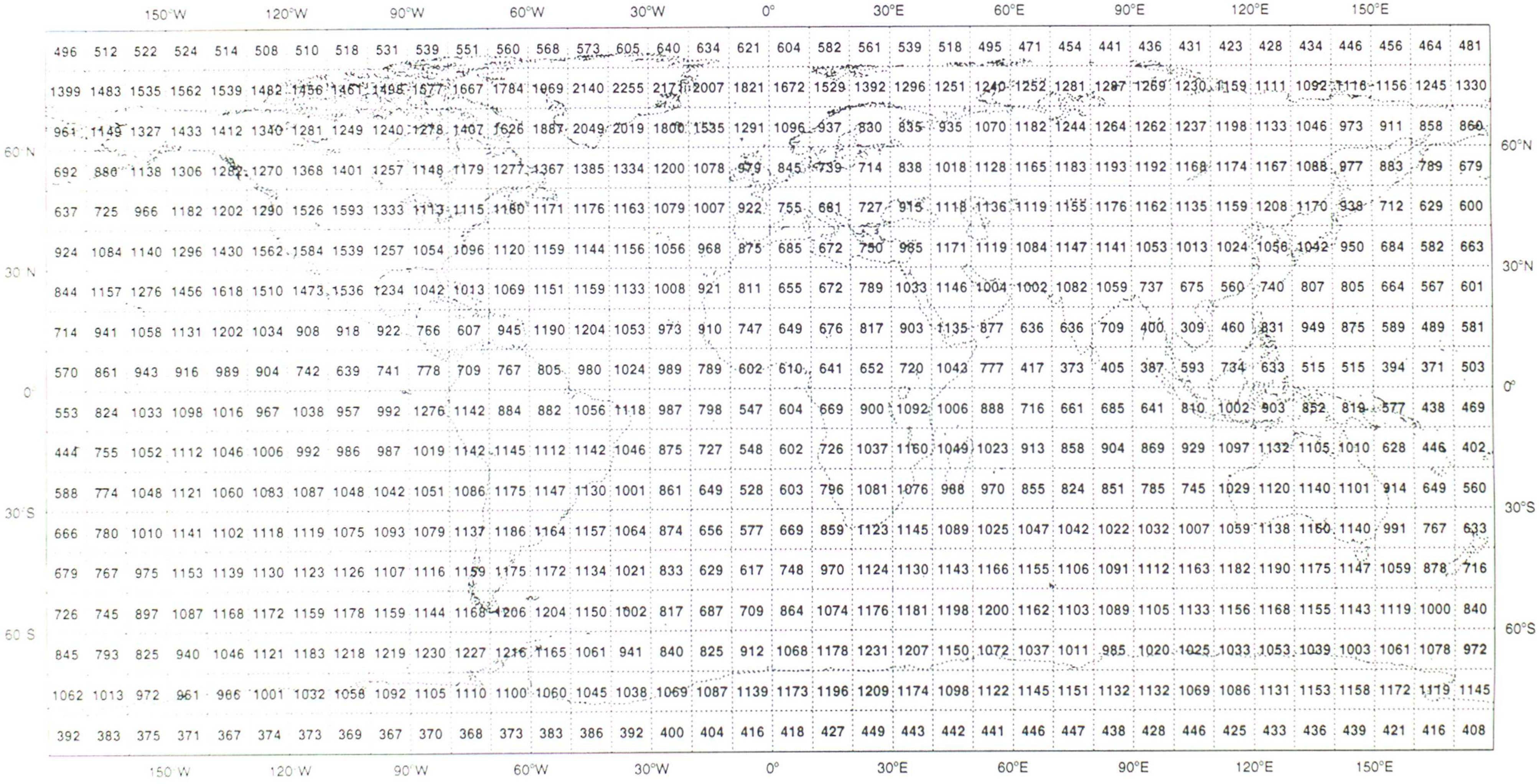
**Selection Criteria** :All soundings.

**Data Extracted** :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. MAY 2002
NOAA15, using all observations
Global average number of observations in 24 hours = 624807

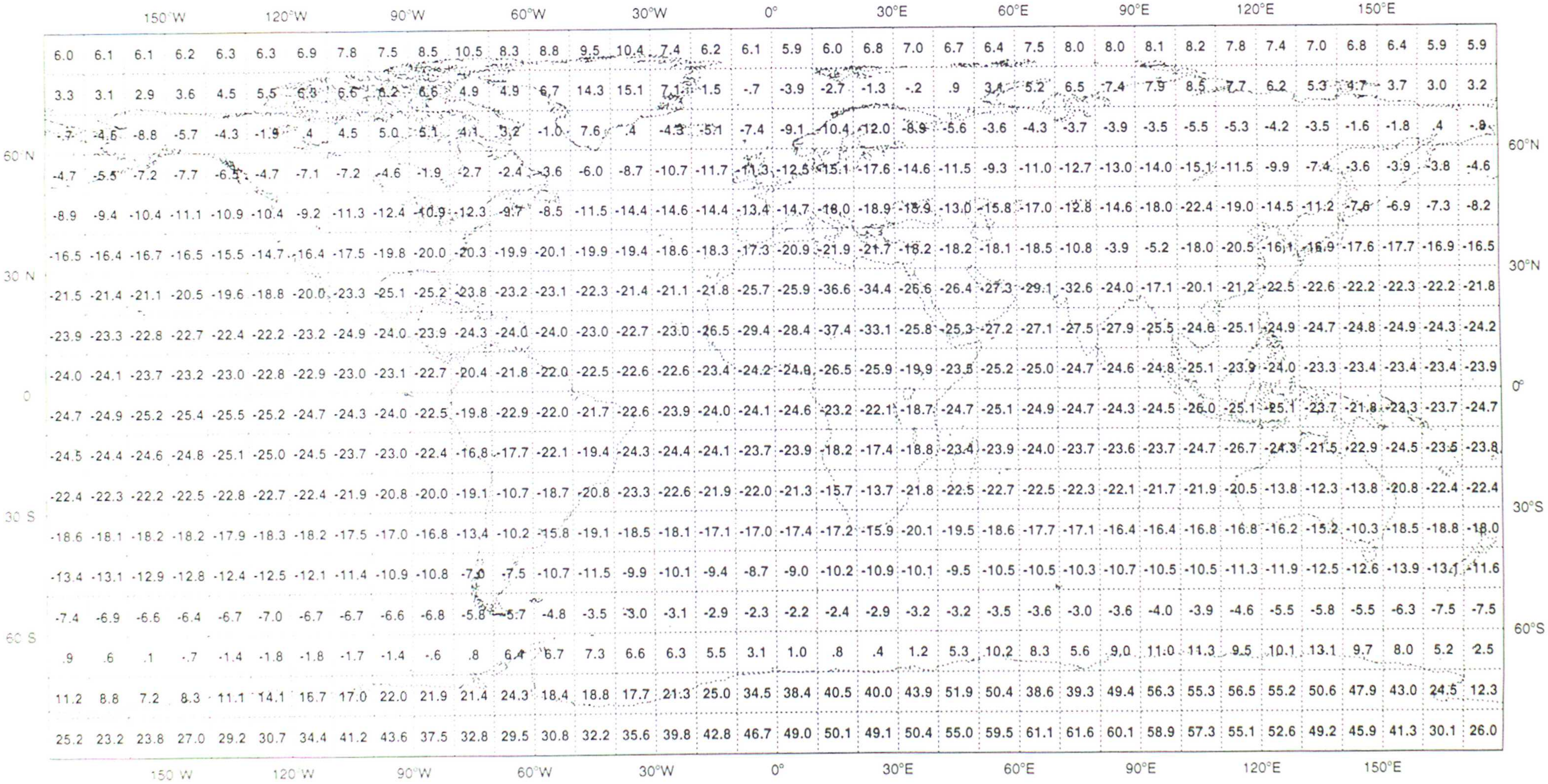


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 496 | 512 | 522 | 524 | 514 | 508 | 510 | 518 | 531 | 539 | 551 | 560 | 568 | 573 | 605 | 640 | 634 | 621 | 604 | 582 | 561 | 539 | 518 | 495 | 471 | 454 | 441 | 436 | 431 | 423 | 428 | 434 | 446 | 456 | 464 | 481 |
| 1399 | 1483 | 1535 | 1562 | 1539 | 1482 | 1456 | 1461 | 1498 | 1577 | 1667 | 1784 | 1069 | 2140 | 2255 | 2171 | 2007 | 1821 | 1672 | 1529 | 1392 | 1296 | 1251 | 1240 | 1252 | 1281 | 1287 | 1269 | 1230 | 1159 | 1111 | 1092 | 1116 | 1156 | 1245 | 1330 |
| 961 | 1149 | 1327 | 1433 | 1412 | 1340 | 1281 | 1249 | 1240 | 1278 | 1407 | 1626 | 1887 | 2049 | 2019 | 1800 | 1535 | 1291 | 1096 | 937 | 830 | 835 | 935 | 1070 | 1182 | 1244 | 1264 | 1262 | 1237 | 1198 | 1133 | 1046 | 973 | 911 | 858 | 860 |
| 692 | 880 | 1138 | 1306 | 1282 | 1270 | 1368 | 1401 | 1257 | 1148 | 1179 | 1277 | 1367 | 1385 | 1334 | 1200 | 1078 | 979 | 845 | 739 | 714 | 838 | 1018 | 1128 | 1165 | 1183 | 1193 | 1192 | 1168 | 1174 | 1167 | 1088 | 977 | 883 | 789 | 679 |
| 637 | 725 | 966 | 1182 | 1202 | 1290 | 1526 | 1593 | 1333 | 1113 | 1115 | 1160 | 1171 | 1176 | 1163 | 1079 | 1007 | 922 | 755 | 681 | 727 | 915 | 1118 | 1136 | 1119 | 1155 | 1176 | 1162 | 1135 | 1159 | 1208 | 1170 | 938 | 712 | 629 | 600 |
| 924 | 1084 | 1140 | 1296 | 1430 | 1562 | 1584 | 1539 | 1257 | 1054 | 1096 | 1120 | 1159 | 1144 | 1156 | 1056 | 968 | 875 | 685 | 672 | 750 | 985 | 1171 | 1119 | 1084 | 1147 | 1141 | 1053 | 1013 | 1024 | 1056 | 1042 | 950 | 684 | 582 | 663 |
| 844 | 1157 | 1276 | 1456 | 1618 | 1510 | 1473 | 1536 | 1234 | 1042 | 1013 | 1069 | 1151 | 1159 | 1133 | 1008 | 921 | 811 | 655 | 672 | 789 | 1033 | 1146 | 1004 | 1002 | 1082 | 1059 | 737 | 675 | 560 | 740 | 807 | 805 | 664 | 567 | 601 |
| 714 | 941 | 1058 | 1131 | 1202 | 1034 | 908 | 918 | 922 | 766 | 607 | 945 | 1190 | 1204 | 1053 | 973 | 910 | 747 | 649 | 676 | 817 | 903 | 1135 | 877 | 636 | 636 | 709 | 400 | 309 | 460 | 831 | 949 | 875 | 589 | 489 | 581 |
| 570 | 861 | 943 | 916 | 989 | 904 | 742 | 639 | 741 | 778 | 709 | 767 | 805 | 980 | 1024 | 989 | 789 | 602 | 610 | 641 | 652 | 720 | 1043 | 777 | 417 | 373 | 405 | 387 | 593 | 734 | 633 | 515 | 515 | 394 | 371 | 503 |
| 553 | 824 | 1033 | 1098 | 1016 | 967 | 1038 | 957 | 992 | 1276 | 1142 | 884 | 882 | 1056 | 1118 | 987 | 798 | 547 | 604 | 669 | 900 | 1092 | 1006 | 888 | 716 | 661 | 685 | 641 | 810 | 1002 | 903 | 852 | 819 | 577 | 438 | 469 |
| 444 | 755 | 1052 | 1112 | 1046 | 1006 | 992 | 986 | 987 | 1019 | 1142 | 1145 | 1112 | 1142 | 1046 | 875 | 727 | 548 | 602 | 726 | 1037 | 1160 | 1049 | 1023 | 913 | 858 | 904 | 869 | 929 | 1097 | 1132 | 1105 | 1010 | 628 | 446 | 402 |
| 588 | 774 | 1048 | 1121 | 1060 | 1083 | 1087 | 1048 | 1042 | 1051 | 1086 | 1175 | 1147 | 1130 | 1001 | 861 | 649 | 528 | 603 | 796 | 1081 | 1076 | 988 | 970 | 855 | 824 | 851 | 785 | 745 | 1029 | 1120 | 1140 | 1101 | 914 | 649 | 560 |
| 666 | 780 | 1010 | 1141 | 1102 | 1118 | 1119 | 1075 | 1093 | 1079 | 1137 | 1186 | 1164 | 1157 | 1064 | 874 | 656 | 577 | 669 | 859 | 1123 | 1145 | 1089 | 1025 | 1047 | 1042 | 1022 | 1032 | 1007 | 1059 | 1138 | 1160 | 1140 | 991 | 767 | 633 |
| 679 | 767 | 975 | 1153 | 1139 | 1130 | 1123 | 1126 | 1107 | 1116 | 1159 | 1175 | 1172 | 1134 | 1021 | 833 | 629 | 617 | 748 | 970 | 1124 | 1130 | 1143 | 1166 | 1155 | 1106 | 1091 | 1112 | 1163 | 1182 | 1190 | 1175 | 1147 | 1059 | 878 | 716 |
| 726 | 745 | 897 | 1087 | 1168 | 1172 | 1159 | 1178 | 1159 | 1144 | 1168 | 1206 | 1204 | 1150 | 1002 | 817 | 687 | 709 | 864 | 1074 | 1176 | 1181 | 1198 | 1200 | 1162 | 1103 | 1089 | 1105 | 1133 | 1156 | 1168 | 1155 | 1143 | 1119 | 1000 | 840 |
| 845 | 793 | 825 | 940 | 1046 | 1121 | 1183 | 1218 | 1219 | 1230 | 1227 | 1216 | 1165 | 1061 | 941 | 840 | 825 | 912 | 1068 | 1178 | 1231 | 1207 | 1150 | 1072 | 1037 | 1011 | 985 | 1020 | 1025 | 1033 | 1053 | 1039 | 1003 | 1061 | 1078 | 972 |
| 1062 | 1013 | 972 | 961 | 966 | 1001 | 1032 | 1058 | 1092 | 1105 | 1110 | 1100 | 1060 | 1045 | 1038 | 1069 | 1087 | 1139 | 1173 | 1196 | 1209 | 1174 | 1098 | 1122 | 1145 | 1151 | 1132 | 1132 | 1069 | 1086 | 1131 | 1153 | 1158 | 1172 | 1119 | 1145 |
| 392 | 383 | 375 | 371 | 367 | 374 | 373 | 369 | 367 | 370 | 368 | 373 | 383 | 386 | 392 | 400 | 404 | 416 | 418 | 427 | 449 | 443 | 442 | 441 | 446 | 447 | 438 | 428 | 446 | 425 | 433 | 436 | 439 | 421 | 416 | 408 |

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002

Channel: HIRS8 (Surface)

NOAA15, using all observations

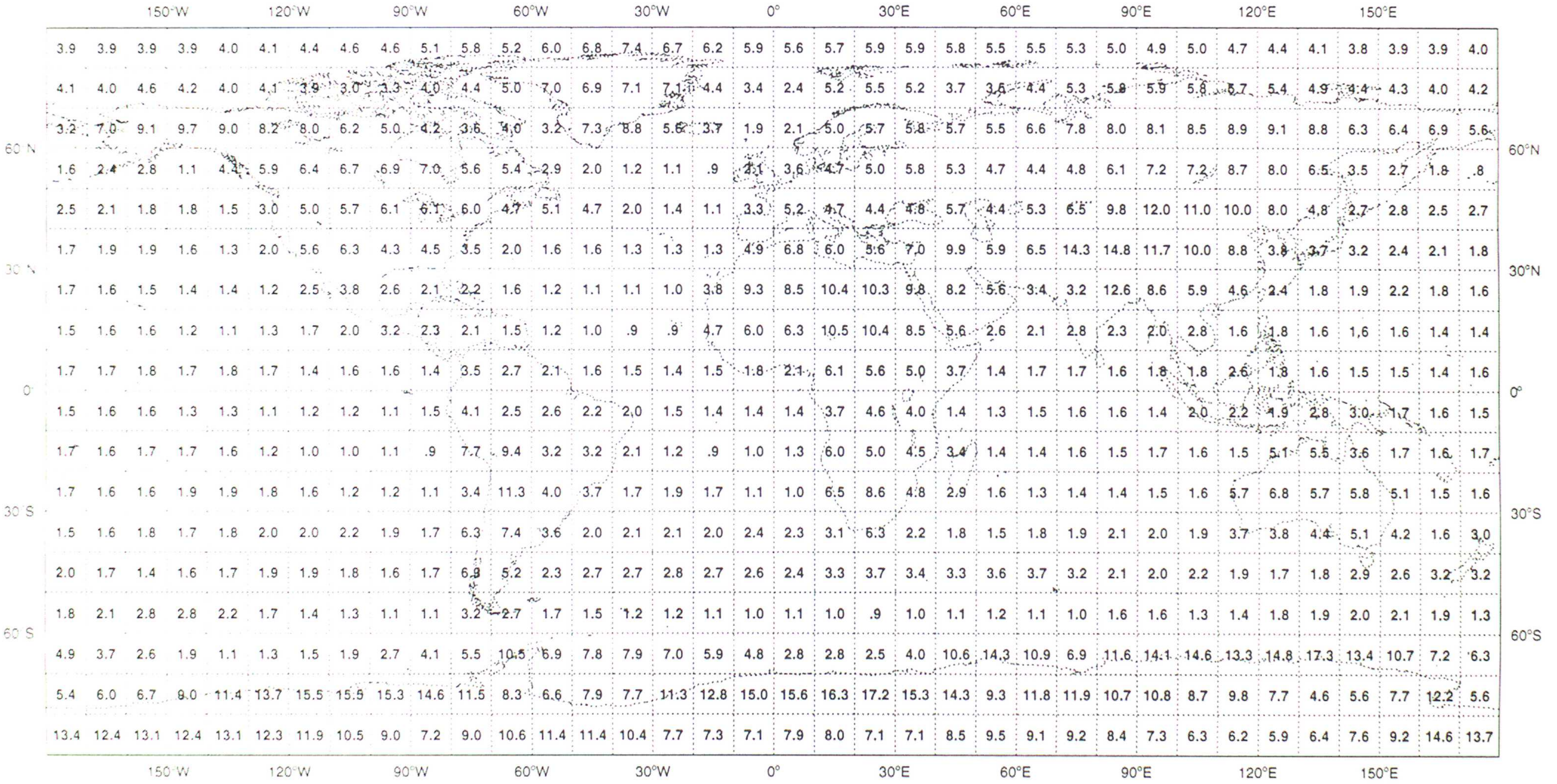


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.0 | 6.1 | 6.1 | 6.2 | 6.3 | 6.3 | 6.9 | 7.8 | 7.5 | 8.5 | 10.5 | 8.3 | 8.8 | 9.5 | 10.4 | 7.4 | 6.2 | 6.1 | 5.9 | 6.0 | 6.8 | 7.0 | 6.7 | 6.4 | 7.5 | 8.0 | 8.0 | 8.1 | 8.2 | 7.8 | 7.4 | 7.0 | 6.8 | 6.4 | 5.9 | 5.9 |
| 3.3 | 3.1 | 2.9 | 3.6 | 4.5 | 5.5 | 6.3 | 6.6 | 6.2 | 6.6 | 4.9 | 4.9 | 6.7 | 14.3 | 15.1 | 7.1 | 1.5 | -.7 | -3.9 | -2.7 | -1.3 | -.2 | .9 | 3.4 | 5.2 | 6.5 | 7.4 | 7.9 | 8.5 | 7.7 | 6.2 | 5.3 | 4.7 | 3.7 | 3.0 | 3.2 |
| -.7 | -4.6 | -8.8 | -5.7 | -4.3 | -1.9 | .4 | 4.5 | 5.0 | 5.1 | 4.1 | 3.2 | -1.0 | 7.6 | .4 | -4.3 | -5.1 | -7.4 | -9.1 | -10.4 | -12.0 | -8.9 | -5.6 | -3.6 | -4.3 | -3.7 | -3.9 | -3.5 | -5.5 | -5.3 | -4.2 | -3.5 | -1.6 | -1.8 | .4 | -.8 |
| -4.7 | -5.5 | -7.2 | -7.7 | -6.5 | -4.7 | -7.1 | -7.2 | -4.6 | -1.9 | -2.7 | -2.4 | -3.6 | -6.0 | -8.7 | -10.7 | -11.7 | -11.3 | -12.5 | -15.1 | -17.6 | -14.6 | -11.5 | -9.3 | -11.0 | -12.7 | -13.0 | -14.0 | -15.1 | -11.5 | -9.9 | -7.4 | -3.6 | -3.9 | -3.8 | -4.6 |
| -8.9 | -9.4 | -10.4 | -11.1 | -10.9 | -10.4 | -9.2 | -11.3 | -12.4 | -10.9 | -12.3 | -9.7 | -8.5 | -11.5 | -14.4 | -14.6 | -14.4 | -13.4 | -14.7 | -18.0 | -18.9 | -18.9 | -13.0 | -15.8 | -17.0 | -12.8 | -14.6 | -18.0 | -22.4 | -19.0 | -14.5 | -11.2 | -7.6 | -6.9 | -7.3 | -8.2 |
| -16.5 | -16.4 | -16.7 | -16.5 | -15.5 | -14.7 | -16.4 | -17.5 | -19.8 | -20.0 | -20.3 | -19.9 | -20.1 | -19.9 | -19.4 | -18.6 | -18.3 | -17.3 | -20.9 | -21.9 | -21.7 | -18.2 | -18.2 | -18.1 | -18.5 | -10.8 | -3.9 | -5.2 | -18.0 | -20.5 | -16.1 | -16.9 | -17.6 | -17.7 | -16.9 | -16.5 |
| -21.5 | -21.4 | -21.1 | -20.5 | -19.6 | -18.8 | -20.0 | -23.3 | -25.1 | -25.2 | -23.8 | -23.2 | -23.1 | -22.3 | -21.4 | -21.1 | -21.8 | -25.7 | -25.9 | -36.6 | -34.4 | -26.6 | -26.4 | -27.3 | -29.1 | -32.6 | -24.0 | -17.1 | -20.1 | -21.2 | -22.5 | -22.6 | -22.2 | -22.3 | -22.2 | -21.8 |
| -23.9 | -23.3 | -22.8 | -22.7 | -22.4 | -22.2 | -23.2 | -24.9 | -24.0 | -23.9 | -24.3 | -24.0 | -24.0 | -23.0 | -22.7 | -23.0 | -26.5 | -29.4 | -28.4 | -37.4 | -33.1 | -25.8 | -25.3 | -27.2 | -27.1 | -27.5 | -27.9 | -25.5 | -24.6 | -25.1 | -24.9 | -24.7 | -24.8 | -24.9 | -24.3 | -24.2 |
| -24.0 | -24.1 | -23.7 | -23.2 | -23.0 | -22.8 | -22.9 | -23.0 | -23.1 | -22.7 | -20.4 | -21.8 | -22.0 | -22.5 | -22.6 | -22.6 | -23.4 | -24.2 | -24.8 | -26.5 | -25.9 | -19.9 | -23.5 | -25.2 | -25.0 | -24.7 | -24.6 | -24.8 | -25.1 | -23.9 | -24.0 | -23.3 | -23.4 | -23.4 | -23.4 | -23.9 |
| -24.7 | -24.9 | -25.2 | -25.4 | -25.5 | -25.2 | -24.7 | -24.3 | -24.0 | -22.5 | -19.8 | -22.9 | -22.0 | -21.7 | -22.6 | -23.9 | -24.0 | -24.1 | -24.6 | -23.2 | -22.1 | -18.7 | -24.7 | -25.1 | -24.9 | -24.7 | -24.3 | -24.5 | -26.0 | -25.1 | -25.1 | -23.7 | -21.8 | -23.3 | -23.7 | -24.7 |
| -24.5 | -24.4 | -24.6 | -24.8 | -25.1 | -25.0 | -24.5 | -23.7 | -23.0 | -22.4 | -16.8 | -17.7 | -22.1 | -19.4 | -24.3 | -24.4 | -24.1 | -23.7 | -23.9 | -18.2 | -17.4 | -18.8 | -23.4 | -23.9 | -24.0 | -23.7 | -23.6 | -23.7 | -24.7 | -26.7 | -24.3 | -21.5 | -22.9 | -24.5 | -23.5 | -23.8 |
| -22.4 | -22.3 | -22.2 | -22.5 | -22.8 | -22.7 | -22.4 | -21.9 | -20.8 | -20.0 | -19.1 | -10.7 | -18.7 | -20.8 | -23.3 | -22.6 | -21.9 | -22.0 | -21.3 | -15.7 | -13.7 | -21.8 | -22.5 | -22.7 | -22.5 | -22.3 | -22.1 | -21.7 | -21.9 | -20.5 | -13.8 | -12.3 | -13.8 | -20.8 | -22.4 | -22.4 |
| -18.6 | -18.1 | -18.2 | -18.2 | -17.9 | -18.3 | -18.2 | -17.5 | -17.0 | -16.8 | -13.4 | -10.2 | -15.8 | -19.1 | -18.5 | -18.1 | -17.1 | -17.0 | -17.4 | -17.2 | -15.9 | -20.1 | -19.5 | -18.6 | -17.7 | -17.1 | -16.4 | -16.4 | -16.8 | -16.8 | -16.2 | -15.2 | -10.3 | -18.5 | -18.8 | -18.0 |
| -13.4 | -13.1 | -12.9 | -12.8 | -12.4 | -12.5 | -12.1 | -11.4 | -10.9 | -10.8 | -7.0 | -7.5 | -10.7 | -11.5 | -9.9 | -10.1 | -9.4 | -8.7 | -9.0 | -10.2 | -10.9 | -10.1 | -9.5 | -10.5 | -10.5 | -10.3 | -10.7 | -10.5 | -10.5 | -11.3 | -11.9 | -12.5 | -12.6 | -13.9 | -13.1 | -11.6 |
| -7.4 | -6.9 | -6.6 | -6.4 | -6.7 | -7.0 | -6.7 | -6.7 | -6.6 | -6.8 | -5.8 | -5.7 | -4.8 | -3.5 | -3.0 | -3.1 | -2.9 | -2.3 | -2.2 | -2.4 | -2.9 | -3.2 | -3.2 | -3.5 | -3.6 | -3.0 | -3.6 | -4.0 | -3.9 | -4.6 | -5.5 | -5.8 | -5.5 | -6.3 | -7.5 | -7.5 |
| .9 | .6 | .1 | -.7 | -1.4 | -1.8 | -1.8 | -1.7 | -1.4 | -.6 | .8 | 6.4 | 6.7 | 7.3 | 6.6 | 6.3 | 5.5 | 3.1 | 1.0 | .8 | .4 | 1.2 | 5.3 | 10.2 | 8.3 | 5.6 | 9.0 | 11.0 | 11.3 | 9.5 | 10.1 | 13.1 | 9.7 | 8.0 | 5.2 | 2.5 |
| 11.2 | 8.8 | 7.2 | 8.3 | 11.1 | 14.1 | 16.7 | 17.0 | 22.0 | 21.9 | 21.4 | 24.3 | 18.4 | 18.8 | 17.7 | 21.3 | 25.0 | 34.5 | 38.4 | 40.5 | 40.0 | 43.9 | 51.9 | 50.4 | 38.6 | 39.3 | 49.4 | 56.3 | 55.3 | 56.5 | 55.2 | 50.6 | 47.9 | 43.0 | 24.5 | 12.3 |
| 25.2 | 23.2 | 23.8 | 27.0 | 29.2 | 30.7 | 34.4 | 41.2 | 43.6 | 37.5 | 32.8 | 29.5 | 30.8 | 32.2 | 35.6 | 39.8 | 42.8 | 46.7 | 49.0 | 50.1 | 49.1 | 50.4 | 55.0 | 59.5 | 61.1 | 61.6 | 60.1 | 58.9 | 57.3 | 55.1 | 52.6 | 49.2 | 45.9 | 41.3 | 30.1 | 26.0 |

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002

Channel: HIRS8 (Surface)

NOAA15, using all observations

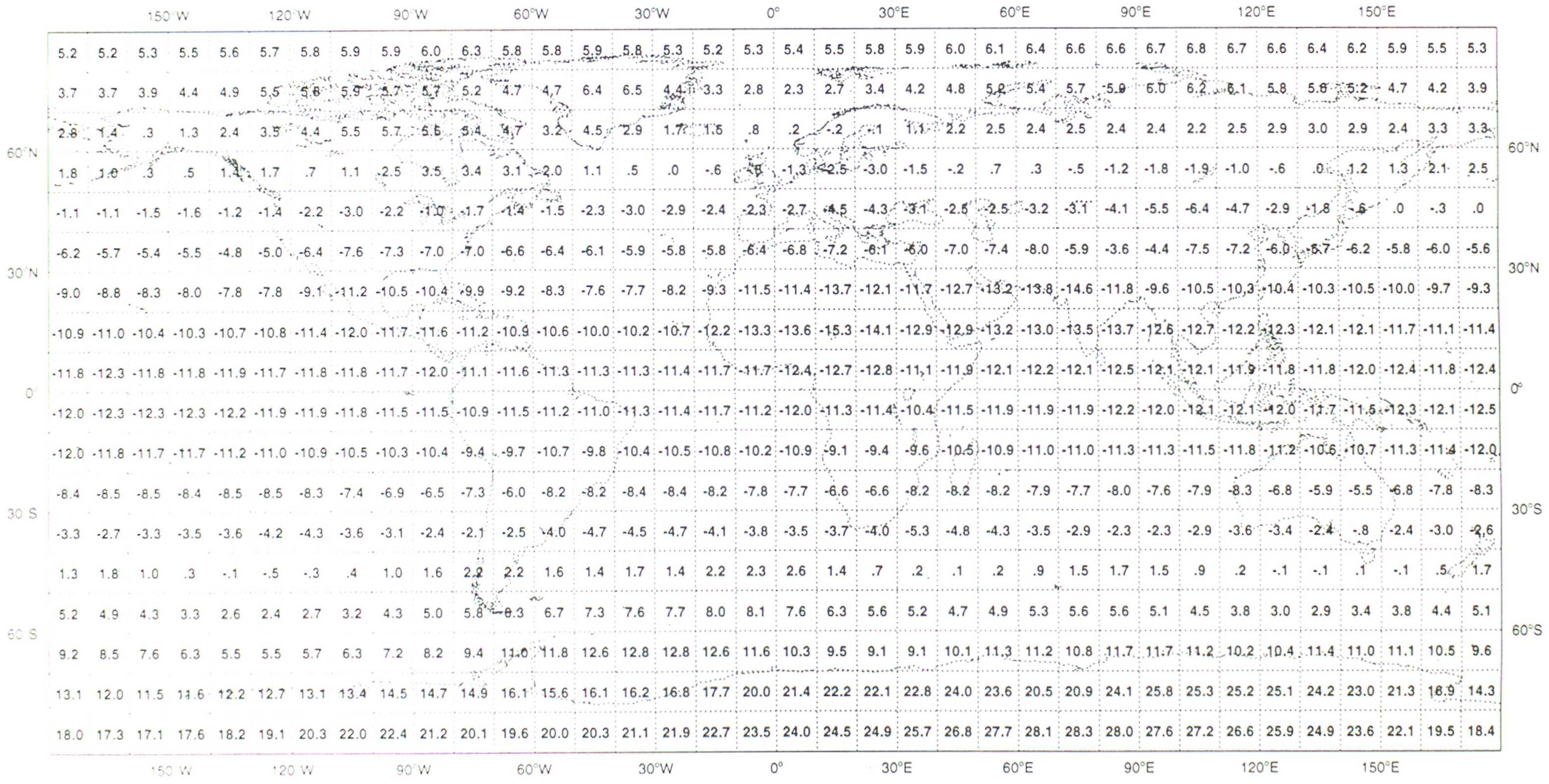


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 4.1 | 4.4 | 4.6 | 4.6 | 5.1 | 5.8 | 5.2 | 6.0 | 6.8 | 7.4 | 6.7 | 6.2 | 5.9 | 5.6 | 5.7 | 5.9 | 5.9 | 5.8 | 5.5 | 5.5 | 5.3 | 5.0 | 4.9 | 5.0 | 4.7 | 4.4 | 4.1 | 3.8 | 3.9 | 3.9 | 4.0 |
| 4.1 | 4.0 | 4.6 | 4.2 | 4.0 | 4.1 | 3.9 | 3.0 | 3.3 | 4.0 | 4.4 | 5.0 | 7.0 | 6.9 | 7.1 | 7.1 | 4.4 | 3.4 | 2.4 | 5.2 | 5.5 | 5.2 | 3.7 | 3.6 | 4.4 | 5.3 | 5.8 | 5.9 | 5.8 | 5.7 | 5.4 | 4.9 | 4.4 | 4.3 | 4.0 | 4.2 |
| 3.2 | 7.0 | 9.1 | 9.7 | 9.0 | 8.2 | 8.0 | 6.2 | 5.0 | 4.2 | 3.6 | 4.0 | 3.2 | 7.3 | 8.8 | 5.6 | 3.7 | 1.9 | 2.1 | 5.0 | 5.7 | 5.8 | 5.7 | 5.5 | 6.6 | 7.8 | 8.0 | 8.1 | 8.5 | 8.9 | 9.1 | 8.8 | 6.3 | 6.4 | 6.9 | 5.6 |
| 1.6 | 2.4 | 2.8 | 1.1 | 4.4 | 5.9 | 6.4 | 6.7 | 6.9 | 7.0 | 5.6 | 5.4 | 2.9 | 2.0 | 1.2 | 1.1 | .9 | 2.1 | 3.6 | 4.7 | 5.0 | 5.8 | 5.3 | 4.7 | 4.4 | 4.8 | 6.1 | 7.2 | 7.2 | 8.7 | 8.0 | 6.5 | 3.5 | 2.7 | 1.8 | .8 |
| 2.5 | 2.1 | 1.8 | 1.8 | 1.5 | 3.0 | 5.0 | 5.7 | 6.1 | 6.1 | 6.0 | 4.7 | 5.1 | 4.7 | 2.0 | 1.4 | 1.1 | 3.3 | 5.2 | 4.7 | 4.4 | 4.8 | 5.7 | 4.4 | 5.3 | 6.5 | 9.8 | 12.0 | 11.0 | 10.0 | 8.0 | 4.8 | 2.7 | 2.8 | 2.5 | 2.7 |
| 1.7 | 1.9 | 1.9 | 1.6 | 1.3 | 2.0 | 5.6 | 6.3 | 4.3 | 4.5 | 3.5 | 2.0 | 1.6 | 1.6 | 1.3 | 1.3 | 1.3 | 4.9 | 6.8 | 6.0 | 5.6 | 7.0 | 9.9 | 5.9 | 6.5 | 14.3 | 14.8 | 11.7 | 10.0 | 8.8 | 3.8 | 3.7 | 3.2 | 2.4 | 2.1 | 1.8 |
| 1.7 | 1.6 | 1.5 | 1.4 | 1.4 | 1.2 | 2.5 | 3.8 | 2.6 | 2.1 | 2.2 | 1.6 | 1.2 | 1.1 | 1.1 | 1.0 | 3.8 | 9.3 | 8.5 | 10.4 | 10.3 | 9.8 | 8.2 | 5.6 | 3.4 | 3.2 | 12.6 | 8.6 | 5.9 | 4.6 | 2.4 | 1.8 | 1.9 | 2.2 | 1.8 | 1.6 |
| 1.5 | 1.6 | 1.6 | 1.2 | 1.1 | 1.3 | 1.7 | 2.0 | 3.2 | 2.3 | 2.1 | 1.5 | 1.2 | 1.0 | .9 | .9 | 4.7 | 6.0 | 6.3 | 10.5 | 10.4 | 8.5 | 5.6 | 2.6 | 2.1 | 2.8 | 2.3 | 2.0 | 2.8 | 1.6 | 1.8 | 1.6 | 1.6 | 1.6 | 1.4 | 1.4 |
| 1.7 | 1.7 | 1.8 | 1.7 | 1.8 | 1.7 | 1.4 | 1.6 | 1.6 | 1.4 | 3.5 | 2.7 | 2.1 | 1.6 | 1.5 | 1.4 | 1.5 | 1.8 | 2.1 | 6.1 | 5.6 | 5.0 | 3.7 | 1.4 | 1.7 | 1.7 | 1.6 | 1.8 | 1.8 | 2.6 | 1.8 | 1.6 | 1.5 | 1.5 | 1.4 | 1.6 |
| 1.5 | 1.6 | 1.6 | 1.3 | 1.3 | 1.1 | 1.2 | 1.2 | 1.1 | 1.5 | 4.1 | 2.5 | 2.6 | 2.2 | 2.0 | 1.5 | 1.4 | 1.4 | 1.4 | 3.7 | 4.6 | 4.0 | 1.4 | 1.3 | 1.5 | 1.6 | 1.6 | 1.4 | 2.0 | 2.2 | 1.9 | 2.8 | 3.0 | 1.7 | 1.6 | 1.5 |
| 1.7 | 1.6 | 1.7 | 1.7 | 1.6 | 1.2 | 1.0 | 1.0 | 1.1 | .9 | 7.7 | 9.4 | 3.2 | 3.2 | 2.1 | 1.2 | .9 | 1.0 | 1.3 | 6.0 | 5.0 | 4.5 | 3.4 | 1.4 | 1.4 | 1.6 | 1.5 | 1.7 | 1.6 | 1.5 | 5.1 | 5.5 | 3.6 | 1.7 | 1.6 | 1.7 |
| 1.7 | 1.6 | 1.6 | 1.9 | 1.9 | 1.8 | 1.6 | 1.2 | 1.2 | 1.1 | 3.4 | 11.3 | 4.0 | 3.7 | 1.7 | 1.9 | 1.7 | 1.1 | 1.0 | 6.5 | 8.6 | 4.8 | 2.9 | 1.6 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 | 5.7 | 6.8 | 5.7 | 5.8 | 5.1 | 1.5 | 1.6 |
| 1.5 | 1.6 | 1.8 | 1.7 | 1.8 | 2.0 | 2.0 | 2.2 | 1.9 | 1.7 | 6.3 | 7.4 | 3.6 | 2.0 | 2.1 | 2.1 | 2.0 | 2.4 | 2.3 | 3.1 | 6.3 | 2.2 | 1.8 | 1.5 | 1.8 | 1.9 | 2.1 | 2.0 | 1.9 | 3.7 | 3.8 | 4.4 | 5.1 | 4.2 | 1.6 | 3.0 |
| 2.0 | 1.7 | 1.4 | 1.6 | 1.7 | 1.9 | 1.9 | 1.8 | 1.6 | 1.7 | 6.8 | 5.2 | 2.3 | 2.7 | 2.7 | 2.8 | 2.7 | 2.6 | 2.4 | 3.3 | 3.7 | 3.4 | 3.3 | 3.6 | 3.7 | 3.2 | 2.1 | 2.0 | 2.2 | 1.9 | 1.7 | 1.8 | 2.9 | 2.6 | 3.2 | 3.2 |
| 1.8 | 2.1 | 2.8 | 2.8 | 2.2 | 1.7 | 1.4 | 1.3 | 1.1 | 1.1 | 3.2 | 2.7 | 1.7 | 1.5 | 1.2 | 1.2 | 1.1 | 1.0 | 1.1 | 1.0 | .9 | 1.0 | 1.1 | 1.2 | 1.1 | 1.0 | 1.6 | 1.6 | 1.3 | 1.4 | 1.8 | 1.9 | 2.0 | 2.1 | 1.9 | 1.3 |
| 4.9 | 3.7 | 2.6 | 1.9 | 1.1 | 1.3 | 1.5 | 1.9 | 2.7 | 4.1 | 5.5 | 10.5 | 6.9 | 7.8 | 7.9 | 7.0 | 5.9 | 4.8 | 2.8 | 2.8 | 2.5 | 4.0 | 10.6 | 14.3 | 10.9 | 6.9 | 11.6 | 14.1 | 14.6 | 13.3 | 14.8 | 17.3 | 13.4 | 10.7 | 7.2 | 6.3 |
| 5.4 | 6.0 | 6.7 | 9.0 | 11.4 | 13.7 | 15.5 | 15.5 | 15.3 | 14.6 | 11.5 | 8.3 | 6.6 | 7.9 | 7.7 | 11.3 | 12.8 | 15.0 | 15.6 | 16.3 | 17.2 | 15.3 | 14.3 | 9.3 | 11.8 | 11.9 | 10.7 | 10.8 | 8.7 | 9.8 | 7.7 | 4.6 | 5.6 | 7.7 | 12.2 | 5.6 |
| 13.4 | 12.4 | 13.1 | 12.4 | 13.1 | 12.3 | 11.9 | 10.5 | 9.0 | 7.2 | 9.0 | 10.6 | 11.4 | 11.4 | 10.4 | 7.7 | 7.3 | 7.1 | 7.9 | 8.0 | 7.1 | 7.1 | 8.5 | 9.5 | 9.1 | 9.2 | 8.4 | 7.3 | 6.3 | 6.2 | 5.9 | 6.4 | 7.6 | 9.2 | 14.6 | 13.7 |

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002

Channel: HIRS15 (700 hPa)

NOAA15, using all observations



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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.2 | 5.2 | 5.3 | 5.5 | 5.6 | 5.7 | 5.8 | 5.9 | 5.9 | 6.0 | 6.3 | 5.8 | 5.8 | 5.9 | 5.8 | 5.3 | 5.2 | 5.3 | 5.4 | 5.5 | 5.8 | 5.9 | 6.0 | 6.1 | 6.4 | 6.6 | 6.6 | 6.7 | 6.8 | 6.7 | 6.6 | 6.4 | 6.2 | 5.9 | 5.5 | 5.3 |
| 3.7 | 3.7 | 3.9 | 4.4 | 4.9 | 5.5 | 5.8 | 5.9 | 5.7 | 5.7 | 5.2 | 4.7 | 4.7 | 6.4 | 6.5 | 4.4 | 3.3 | 2.8 | 2.3 | 2.7 | 3.4 | 4.2 | 4.8 | 5.2 | 5.4 | 5.7 | 5.9 | 6.0 | 6.2 | 6.1 | 5.8 | 5.8 | 5.2 | 4.7 | 4.2 | 3.9 |
| 2.8 | 1.4 | .3 | 1.3 | 2.4 | 3.5 | 4.4 | 5.5 | 5.7 | 5.6 | 5.4 | 4.7 | 3.2 | 4.5 | 2.9 | 1.7 | 1.5 | .8 | .2 | -.2 | -.1 | 1.1 | 2.2 | 2.5 | 2.4 | 2.5 | 2.4 | 2.4 | 2.2 | 2.5 | 2.9 | 3.0 | 2.9 | 2.4 | 3.3 | 3.3 |
| 1.8 | 1.0 | .3 | .5 | 1.4 | 1.7 | .7 | 1.1 | 2.5 | 3.5 | 3.4 | 3.1 | 2.0 | 1.1 | .5 | .0 | -.6 | -.8 | -1.3 | -2.5 | -3.0 | -1.5 | -.2 | .7 | .3 | -.5 | -1.2 | -1.8 | -1.9 | -1.0 | -.6 | .0 | 1.2 | 1.3 | 2.1 | 2.5 |
| -1.1 | -1.1 | -1.5 | -1.6 | -1.2 | -1.4 | -2.2 | -3.0 | -2.2 | -1.0 | -1.7 | -1.4 | -1.5 | -2.3 | -3.0 | -2.9 | -2.4 | -2.3 | -2.7 | -4.5 | -4.3 | -3.1 | -2.5 | -2.5 | -3.2 | -3.1 | -4.1 | -5.5 | -6.4 | -4.7 | -2.9 | -1.8 | -.6 | .0 | -.3 | .0 |
| -6.2 | -5.7 | -5.4 | -5.5 | -4.8 | -5.0 | -6.4 | -7.6 | -7.3 | -7.0 | -7.0 | -6.6 | -6.4 | -6.1 | -5.9 | -5.8 | -5.8 | -6.4 | -6.8 | -7.2 | -6.1 | -6.0 | -7.0 | -7.4 | -8.0 | -5.9 | -3.6 | -4.4 | -7.5 | -7.2 | -6.0 | -5.7 | -6.2 | -5.8 | -6.0 | -5.6 |
| -9.0 | -8.8 | -8.3 | -8.0 | -7.8 | -7.8 | -9.1 | -11.2 | -10.5 | -10.4 | -9.9 | -9.2 | -8.3 | -7.6 | -7.7 | -8.2 | -9.3 | -11.5 | -11.4 | -13.7 | -12.1 | -11.7 | -12.7 | -13.2 | -13.8 | -14.6 | -11.8 | -9.6 | -10.5 | -10.3 | -10.4 | -10.3 | -10.5 | -10.0 | -9.7 | -9.3 |
| -10.9 | -11.0 | -10.4 | -10.3 | -10.7 | -10.8 | -11.4 | -12.0 | -11.7 | -11.6 | -11.2 | -10.9 | -10.6 | -10.0 | -10.2 | -10.7 | -12.2 | -13.3 | -13.6 | -15.3 | -14.1 | -12.9 | -12.9 | -13.2 | -13.0 | -13.5 | -13.7 | -12.6 | -12.7 | -12.2 | -12.3 | -12.1 | -12.1 | -11.7 | -11.1 | -11.4 |
| -11.8 | -12.3 | -11.8 | -11.8 | -11.9 | -11.7 | -11.8 | -11.8 | -11.7 | -12.0 | -11.1 | -11.6 | -11.3 | -11.3 | -11.3 | -11.4 | -11.7 | -11.7 | -12.4 | -12.7 | -12.8 | -11.1 | -11.9 | -12.1 | -12.2 | -12.1 | -12.5 | -12.1 | -12.1 | -11.9 | -11.8 | -11.8 | -12.0 | -12.4 | -11.8 | -12.4 |
| -12.0 | -12.3 | -12.3 | -12.3 | -12.2 | -11.9 | -11.9 | -11.8 | -11.5 | -11.5 | -10.9 | -11.5 | -11.2 | -11.0 | -11.3 | -11.4 | -11.7 | -11.2 | -12.0 | -11.3 | -11.4 | -10.4 | -11.5 | -11.9 | -11.9 | -11.9 | -12.2 | -12.0 | -12.1 | -12.1 | -12.0 | -11.7 | -11.5 | -12.3 | -12.1 | -12.5 |
| -12.0 | -11.8 | -11.7 | -11.7 | -11.2 | -11.0 | -10.9 | -10.5 | -10.3 | -10.4 | -9.4 | -9.7 | -10.7 | -9.8 | -10.4 | -10.5 | -10.8 | -10.2 | -10.9 | -9.1 | -9.4 | -9.6 | -10.5 | -10.9 | -11.0 | -11.0 | -11.3 | -11.3 | -11.5 | -11.8 | -11.2 | -10.6 | -10.7 | -11.3 | -11.4 | -12.0 |
| -8.4 | -8.5 | -8.5 | -8.4 | -8.5 | -8.5 | -8.3 | -7.4 | -6.9 | -6.5 | -7.3 | -6.0 | -8.2 | -8.2 | -8.4 | -8.4 | -8.2 | -7.8 | -7.7 | -6.6 | -6.6 | -8.2 | -8.2 | -8.2 | -7.9 | -7.7 | -8.0 | -7.6 | -7.9 | -8.3 | -6.8 | -5.9 | -5.5 | -6.8 | -7.8 | -8.3 |
| -3.3 | -2.7 | -3.3 | -3.5 | -3.6 | -4.2 | -4.3 | -3.6 | -3.1 | -2.4 | -2.1 | -2.5 | -4.0 | -4.7 | -4.5 | -4.7 | -4.1 | -3.8 | -3.5 | -3.7 | -4.0 | -5.3 | -4.8 | -4.3 | -3.5 | -2.9 | -2.3 | -2.3 | -2.9 | -3.6 | -3.4 | -2.4 | -.8 | -2.4 | -3.0 | -2.6 |
| 1.3 | 1.8 | 1.0 | .3 | -.1 | -.5 | -.3 | .4 | 1.0 | 1.6 | 2.2 | 2.2 | 1.6 | 1.4 | 1.7 | 1.4 | 2.2 | 2.3 | 2.6 | 1.4 | .7 | .2 | .1 | .2 | .9 | 1.5 | 1.7 | 1.5 | .9 | .2 | -.1 | -.1 | .1 | -.1 | .5 | 1.7 |
| 5.2 | 4.9 | 4.3 | 3.3 | 2.6 | 2.4 | 2.7 | 3.2 | 4.3 | 5.0 | 5.8 | 6.3 | 6.7 | 7.3 | 7.6 | 7.7 | 8.0 | 8.1 | 7.6 | 6.3 | 5.6 | 5.2 | 4.7 | 4.9 | 5.3 | 5.6 | 5.6 | 5.1 | 4.5 | 3.8 | 3.0 | 2.9 | 3.4 | 3.8 | 4.4 | 5.1 |
| 9.2 | 8.5 | 7.6 | 6.3 | 5.5 | 5.5 | 5.7 | 6.3 | 7.2 | 8.2 | 9.4 | 11.0 | 11.8 | 12.6 | 12.8 | 12.8 | 12.6 | 11.6 | 10.3 | 9.5 | 9.1 | 9.1 | 10.1 | 11.3 | 11.2 | 10.8 | 11.7 | 11.7 | 11.2 | 10.2 | 10.4 | 11.4 | 11.0 | 11.1 | 10.5 | 9.6 |
| 13.1 | 12.0 | 11.5 | 11.6 | 12.2 | 12.7 | 13.1 | 13.4 | 14.5 | 14.7 | 14.9 | 16.1 | 15.6 | 16.1 | 16.2 | 16.8 | 17.7 | 20.0 | 21.4 | 22.2 | 22.1 | 22.8 | 24.0 | 23.6 | 20.5 | 20.9 | 24.1 | 25.8 | 25.3 | 25.2 | 25.1 | 24.2 | 23.0 | 21.3 | 18.9 | 14.3 |
| 18.0 | 17.3 | 17.1 | 17.6 | 18.2 | 19.1 | 20.3 | 22.0 | 22.4 | 21.2 | 20.1 | 19.6 | 20.0 | 20.3 | 21.1 | 21.9 | 22.7 | 23.5 | 24.0 | 24.5 | 24.9 | 25.7 | 26.8 | 27.7 | 28.1 | 28.3 | 28.0 | 27.6 | 27.2 | 26.6 | 25.9 | 24.9 | 23.6 | 22.1 | 19.5 | 18.4 |

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). **MAY 2002**

Channel: HIRS15 (700 hPa)

NOAA15, using all observations

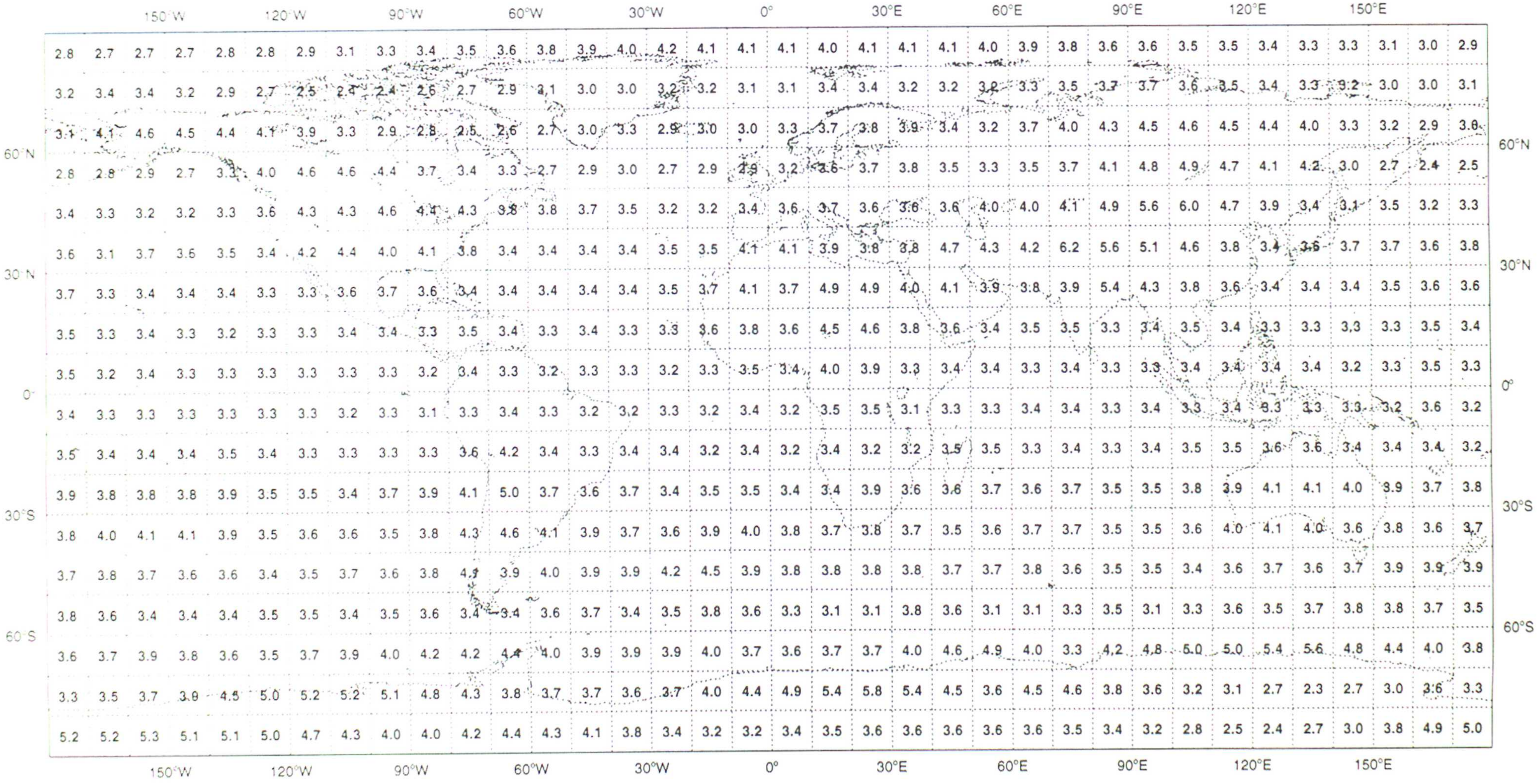
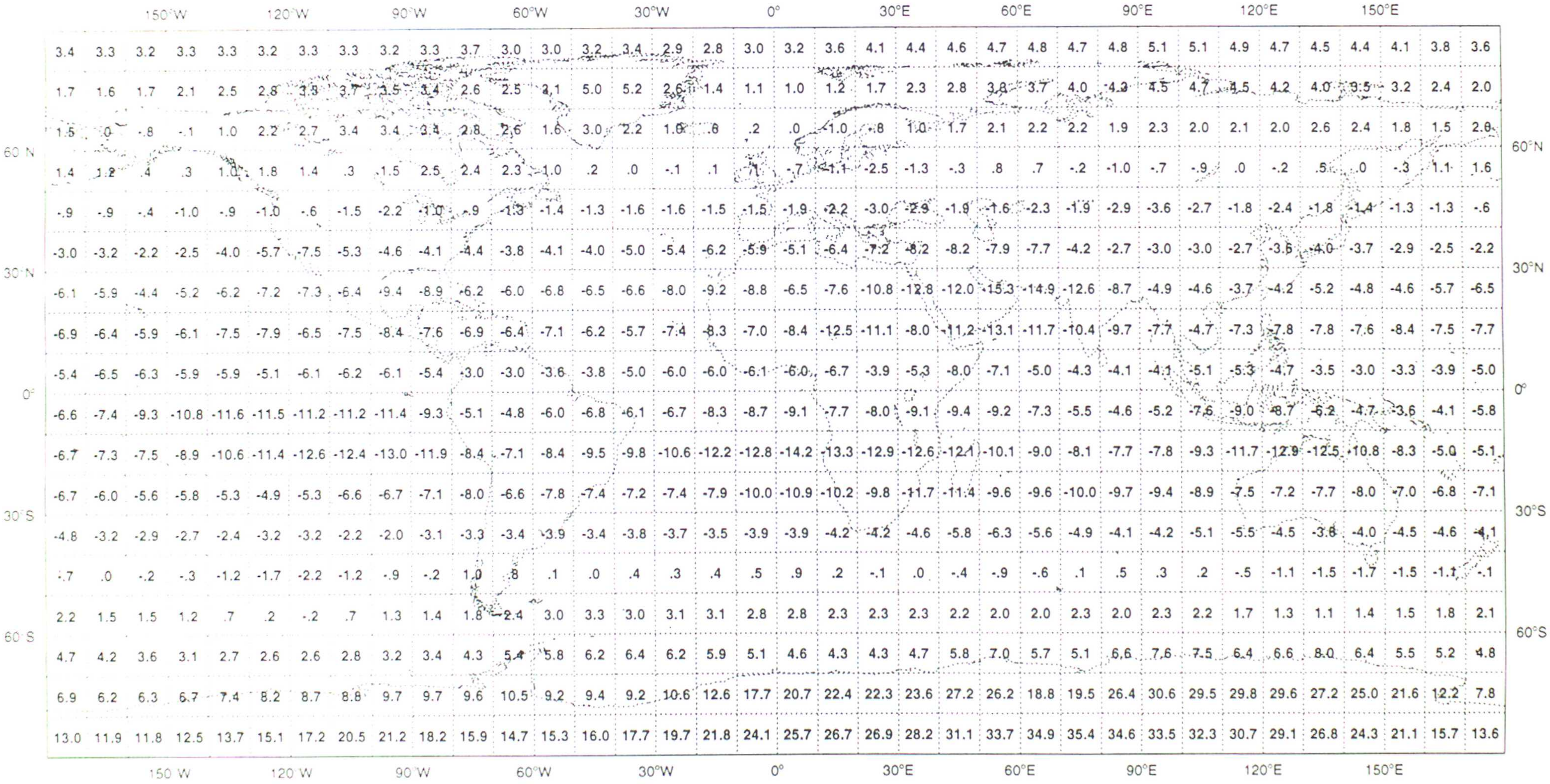
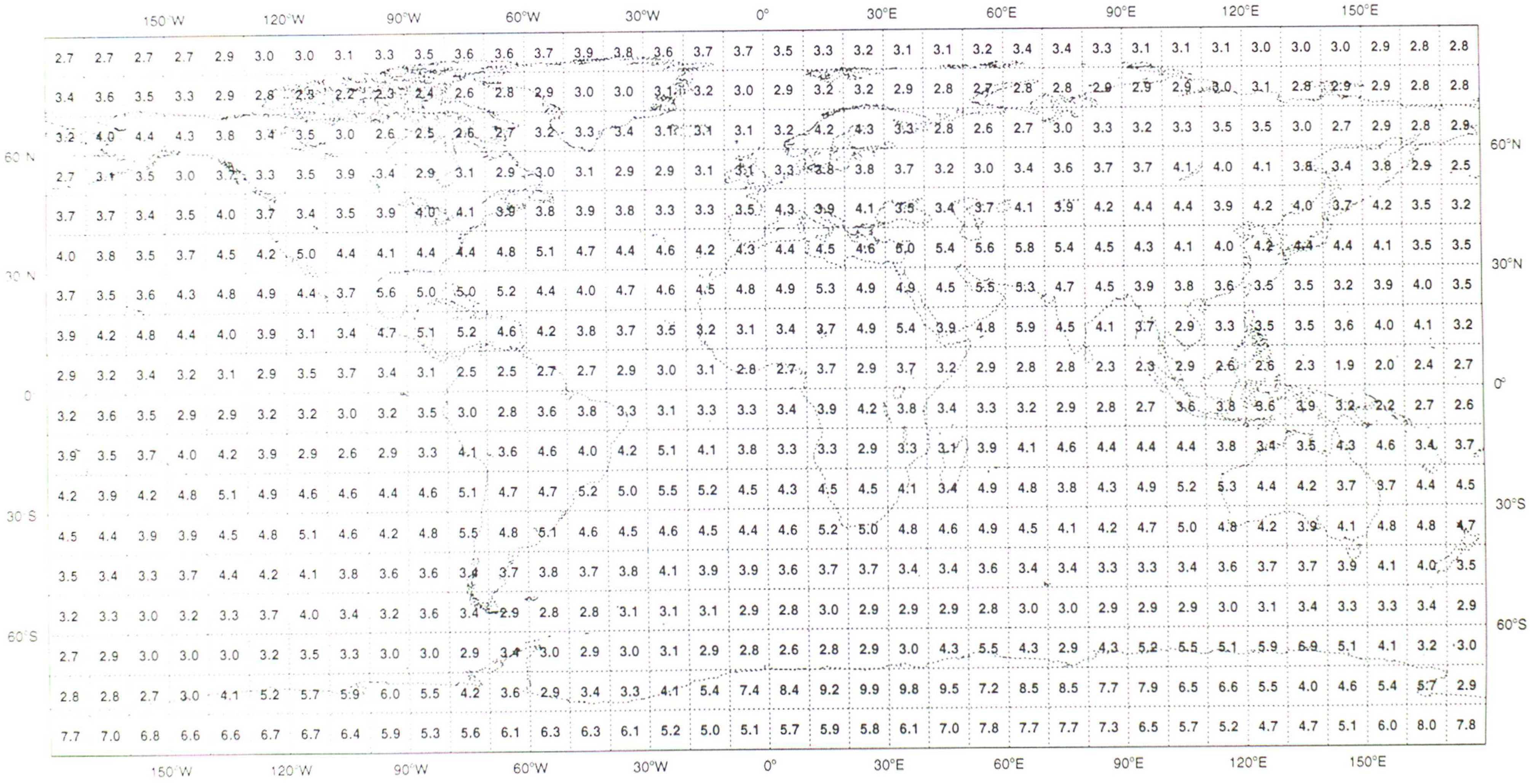

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.8 2.7 2.7 2.7 2.8 2.8 2.9 3.1 3.3 3.4 3.5 3.6 3.8 3.9 4.0 4.2 4.1 4.1 4.1 4.0 4.1 4.1 4.1 4.0 3.9 3.8 3.6 3.6 3.5 3.5 3.4 3.3 3.3 3.1 3.0 2.9
3.2 3.4 3.4 3.2 2.9 2.7 2.5 2.4 2.4 2.6 2.7 2.9 3.1 3.0 3.0 3.2 3.2 3.1 3.1 3.4 3.4 3.2 3.2 3.2 3.3 3.5 3.7 3.7 3.6 3.5 3.4 3.3 3.2 3.0 3.0 3.1
3.1 4.1 4.6 4.5 4.4 4.1 3.9 3.3 2.9 2.8 2.5 2.6 2.7 3.0 3.3 2.9 3.0 3.0 3.3 3.7 3.8 3.9 3.4 3.2 3.7 4.0 4.3 4.5 4.6 4.5 4.4 4.0 3.3 3.2 2.9 3.0
2.8 2.8 2.9 2.7 3.3 4.0 4.6 4.6 4.4 3.7 3.4 3.3 2.7 2.9 3.0 2.7 2.9 2.9 3.2 3.6 3.7 3.8 3.5 3.3 3.5 3.7 4.1 4.8 4.9 4.7 4.1 4.2 3.0 2.7 2.4 2.5
3.4 3.3 3.2 3.2 3.3 3.6 4.3 4.3 4.6 4.4 4.3 3.8 3.8 3.7 3.5 3.2 3.2 3.4 3.6 3.7 3.6 3.6 3.6 4.0 4.0 4.1 4.9 5.6 6.0 4.7 3.9 3.4 3.1 3.5 3.2 3.3
3.6 3.1 3.7 3.6 3.5 3.4 4.2 4.4 4.0 4.1 3.8 3.4 3.4 3.4 3.4 3.5 3.5 4.1 4.1 3.9 3.8 3.8 4.7 4.3 4.2 6.2 5.6 5.1 4.6 3.8 3.4 3.6 3.7 3.7 3.6 3.8
3.7 3.3 3.4 3.4 3.4 3.3 3.3 3.6 3.7 3.6 3.4 3.4 3.4 3.4 3.4 3.5 3.7 4.1 3.7 4.9 4.9 4.0 4.1 3.9 3.8 3.9 5.4 4.3 3.8 3.6 3.4 3.4 3.4 3.5 3.6 3.6
3.5 3.3 3.4 3.3 3.2 3.3 3.3 3.4 3.4 3.3 3.5 3.4 3.3 3.4 3.3 3.3 3.6 3.8 3.6 4.5 4.6 3.8 3.6 3.4 3.5 3.5 3.3 3.4 3.5 3.4 3.3 3.3 3.3 3.3 3.5 3.4
3.5 3.2 3.4 3.3 3.3 3.3 3.3 3.3 3.3 3.2 3.4 3.3 3.2 3.3 3.3 3.2 3.3 3.5 3.4 4.0 3.9 3.3 3.4 3.4 3.3 3.4 3.3 3.3 3.4 3.4 3.4 3.4 3.2 3.3 3.5 3.3
3.4 3.3 3.3 3.3 3.3 3.3 3.3 3.2 3.3 3.1 3.3 3.4 3.3 3.2 3.2 3.3 3.2 3.4 3.2 3.5 3.5 3.1 3.3 3.3 3.4 3.4 3.3 3.4 3.3 3.4 3.3 3.3 3.3 3.2 3.6 3.2
3.5 3.4 3.4 3.4 3.5 3.4 3.3 3.3 3.3 3.3 3.6 4.2 3.4 3.3 3.4 3.4 3.2 3.4 3.2 3.4 3.2 3.2 3.5 3.5 3.3 3.4 3.3 3.4 3.5 3.5 3.6 3.6 3.4 3.4 3.4 3.2
3.9 3.8 3.8 3.8 3.9 3.5 3.5 3.4 3.7 3.9 4.1 5.0 3.7 3.6 3.7 3.4 3.5 3.5 3.4 3.4 3.9 3.6 3.6 3.7 3.6 3.7 3.5 3.5 3.8 3.9 4.1 4.1 4.0 3.9 3.7 3.8
3.8 4.0 4.1 4.1 3.9 3.5 3.6 3.6 3.5 3.8 4.3 4.6 4.1 3.9 3.7 3.6 3.9 4.0 3.8 3.7 3.8 3.7 3.5 3.6 3.7 3.7 3.5 3.5 3.6 4.0 4.1 4.0 3.6 3.8 3.6 3.7
3.7 3.8 3.7 3.6 3.6 3.4 3.5 3.7 3.6 3.8 4.1 3.9 4.0 3.9 3.9 4.2 4.5 3.9 3.8 3.8 3.8 3.8 3.7 3.7 3.8 3.6 3.5 3.5 3.4 3.6 3.7 3.6 3.7 3.9 3.9 3.9
3.8 3.6 3.4 3.4 3.4 3.5 3.5 3.4 3.5 3.6 3.4 3.4 3.6 3.7 3.4 3.5 3.8 3.6 3.3 3.1 3.1 3.8 3.6 3.1 3.1 3.3 3.5 3.1 3.3 3.6 3.5 3.7 3.8 3.8 3.7 3.5
3.6 3.7 3.9 3.8 3.6 3.5 3.7 3.9 4.0 4.2 4.2 4.4 4.0 3.9 3.9 3.9 4.0 3.7 3.6 3.7 3.7 4.0 4.6 4.9 4.0 3.3 4.2 4.8 5.0 5.0 5.4 5.6 4.8 4.4 4.0 3.8
3.3 3.5 3.7 3.9 4.5 5.0 5.2 5.2 5.1 4.8 4.3 3.8 3.7 3.7 3.6 3.7 4.0 4.4 4.9 5.4 5.8 5.4 4.5 3.6 4.5 4.6 3.8 3.6 3.2 3.1 2.7 2.3 2.7 3.0 3.6 3.3
5.2 5.2 5.3 5.1 5.1 5.0 4.7 4.3 4.0 4.0 4.2 4.4 4.3 4.1 3.8 3.4 3.2 3.2 3.4 3.5 3.6 3.6 3.6 3.6 3.6 3.5 3.4 3.2 2.8 2.5 2.4 2.7 3.0 3.8 4.9 5.0

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



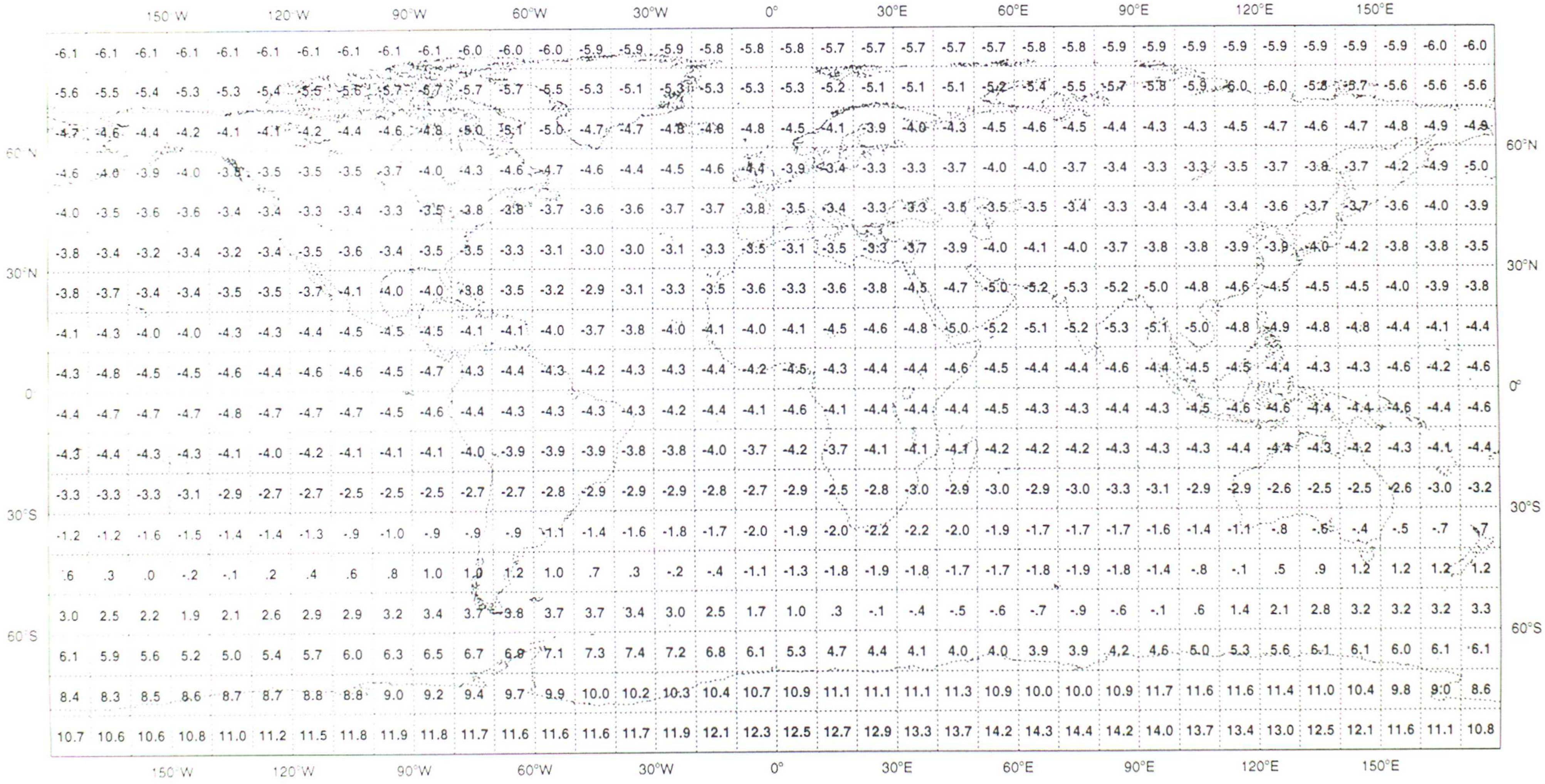
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.4 | 3.3 | 3.2 | 3.3 | 3.3 | 3.2 | 3.3 | 3.3 | 3.2 | 3.3 | 3.7 | 3.0 | 3.0 | 3.2 | 3.4 | 2.9 | 2.8 | 3.0 | 3.2 | 3.6 | 4.1 | 4.4 | 4.6 | 4.7 | 4.8 | 4.7 | 4.8 | 5.1 | 5.1 | 4.9 | 4.7 | 4.5 | 4.4 | 4.1 | 3.8 | 3.6 |
| 1.7 | 1.6 | 1.7 | 2.1 | 2.5 | 2.8 | 3.3 | 3.7 | 3.5 | 3.4 | 2.6 | 2.5 | 2.1 | 5.0 | 5.2 | 2.6 | 1.4 | 1.1 | 1.0 | 1.2 | 1.7 | 2.3 | 2.8 | 3.8 | 3.7 | 4.0 | 4.3 | 4.5 | 4.7 | 4.5 | 4.2 | 4.0 | 3.5 | 3.2 | 2.4 | 2.0 |
| 1.5 | .0 | -.8 | -.1 | 1.0 | 2.2 | 2.7 | 3.4 | 3.4 | 3.4 | 2.8 | 2.6 | 1.6 | 3.0 | 2.2 | 1.0 | .8 | .2 | .0 | -1.0 | -.8 | 1.0 | 1.7 | 2.1 | 2.2 | 2.2 | 1.9 | 2.3 | 2.0 | 2.1 | 2.0 | 2.6 | 2.4 | 1.8 | 1.5 | 2.0 |
| 1.4 | 1.2 | .4 | .3 | 1.0 | 1.8 | 1.4 | .3 | 1.5 | 2.5 | 2.4 | 2.3 | 1.0 | .2 | .0 | -.1 | .1 | .1 | -.7 | -1.1 | -2.5 | -1.3 | -.3 | .8 | .7 | -.2 | -1.0 | -.7 | -.9 | .0 | -.2 | .5 | .0 | -.3 | 1.1 | 1.6 |
| -.9 | -.9 | -.4 | -1.0 | -.9 | -1.0 | -.6 | -1.5 | -2.2 | -1.0 | -.9 | -1.3 | -1.4 | -1.3 | -1.6 | -1.6 | -1.5 | -1.5 | -1.9 | -2.2 | -3.0 | -2.9 | -1.9 | -1.6 | -2.3 | -1.9 | -2.9 | -3.6 | -2.7 | -1.8 | -2.4 | -1.8 | -1.4 | -1.3 | -1.3 | -.6 |
| -3.0 | -3.2 | -2.2 | -2.5 | -4.0 | -5.7 | -7.5 | -5.3 | -4.6 | -4.1 | -4.4 | -3.8 | -4.1 | -4.0 | -5.0 | -5.4 | -6.2 | -5.9 | -5.1 | -6.4 | -7.2 | -8.2 | -8.2 | -7.9 | -7.7 | -4.2 | -2.7 | -3.0 | -3.0 | -2.7 | -3.6 | -4.0 | -3.7 | -2.9 | -2.5 | -2.2 |
| -6.1 | -5.9 | -4.4 | -5.2 | -6.2 | -7.2 | -7.3 | -6.4 | -9.4 | -8.9 | -6.2 | -6.0 | -6.8 | -6.5 | -6.6 | -8.0 | -9.2 | -8.8 | -6.5 | -7.6 | -10.8 | -12.8 | -12.0 | -15.3 | -14.9 | -12.6 | -8.7 | -4.9 | -4.6 | -3.7 | -4.2 | -5.2 | -4.8 | -4.6 | -5.7 | -6.5 |
| -6.9 | -6.4 | -5.9 | -6.1 | -7.5 | -7.9 | -6.5 | -7.5 | -8.4 | -7.6 | -6.9 | -6.4 | -7.1 | -6.2 | -5.7 | -7.4 | -8.3 | -7.0 | -8.4 | -12.5 | -11.1 | -8.0 | -11.2 | -13.1 | -11.7 | -10.4 | -9.7 | -7.7 | -4.7 | -7.3 | -7.8 | -7.8 | -7.6 | -8.4 | -7.5 | -7.7 |
| -5.4 | -6.5 | -6.3 | -5.9 | -5.9 | -5.1 | -6.1 | -6.2 | -6.1 | -5.4 | -3.0 | -3.0 | -3.6 | -3.8 | -5.0 | -6.0 | -6.0 | -6.1 | -6.0 | -6.7 | -3.9 | -5.3 | -8.0 | -7.1 | -5.0 | -4.3 | -4.1 | -4.1 | -5.1 | -5.3 | -4.7 | -3.5 | -3.0 | -3.3 | -3.9 | -5.0 |
| -6.6 | -7.4 | -9.3 | -10.8 | -11.6 | -11.5 | -11.2 | -11.2 | -11.4 | -9.3 | -5.1 | -4.8 | -6.0 | -6.8 | -6.1 | -6.7 | -8.3 | -8.7 | -9.1 | -7.7 | -8.0 | -9.1 | -9.4 | -9.2 | -7.3 | -5.5 | -4.6 | -5.2 | -7.6 | -9.0 | -8.7 | -6.2 | -4.7 | -3.6 | -4.1 | -5.8 |
| -6.7 | -7.3 | -7.5 | -8.9 | -10.6 | -11.4 | -12.6 | -12.4 | -13.0 | -11.9 | -8.4 | -7.1 | -8.4 | -9.5 | -9.8 | -10.6 | -12.2 | -12.8 | -14.2 | -13.3 | -12.9 | -12.6 | -12.1 | -10.1 | -9.0 | -8.1 | -7.7 | -7.8 | -9.3 | -11.7 | -12.9 | -12.5 | -10.8 | -8.3 | -5.0 | -5.1 |
| -6.7 | -6.0 | -5.6 | -5.8 | -5.3 | -4.9 | -5.3 | -6.6 | -6.7 | -7.1 | -8.0 | -6.6 | -7.8 | -7.4 | -7.2 | -7.4 | -7.9 | -10.0 | -10.9 | -10.2 | -9.8 | -11.7 | -11.4 | -9.6 | -9.6 | -10.0 | -9.7 | -9.4 | -8.9 | -7.5 | -7.2 | -7.7 | -8.0 | -7.0 | -6.8 | -7.1 |
| -4.8 | -3.2 | -2.9 | -2.7 | -2.4 | -3.2 | -3.2 | -2.2 | -2.0 | -3.1 | -3.3 | -3.4 | -3.9 | -3.4 | -3.8 | -3.7 | -3.5 | -3.9 | -3.9 | -4.2 | -4.2 | -4.6 | -5.8 | -6.3 | -5.6 | -4.9 | -4.1 | -4.2 | -5.1 | -5.5 | -4.5 | -3.8 | -4.0 | -4.5 | -4.6 | -4.1 |
| -.7 | .0 | -.2 | -.3 | -1.2 | -1.7 | -2.2 | -1.2 | -.9 | -.2 | 1.0 | .8 | .1 | .0 | .4 | .3 | .4 | .5 | .9 | .2 | -.1 | .0 | -.4 | -.9 | -.6 | .1 | .5 | .3 | .2 | -.5 | -1.1 | -1.5 | -1.7 | -1.5 | -1.1 | -.1 |
| 2.2 | 1.5 | 1.5 | 1.2 | .7 | .2 | -.2 | .7 | 1.3 | 1.4 | 1.8 | 2.4 | 3.0 | 3.3 | 3.0 | 3.1 | 3.1 | 2.8 | 2.8 | 2.3 | 2.3 | 2.3 | 2.2 | 2.0 | 2.0 | 2.3 | 2.0 | 2.3 | 2.2 | 1.7 | 1.3 | 1.1 | 1.4 | 1.5 | 1.8 | 2.1 |
| 4.7 | 4.2 | 3.6 | 3.1 | 2.7 | 2.6 | 2.6 | 2.8 | 3.2 | 3.4 | 4.3 | 5.4 | 5.8 | 6.2 | 6.4 | 6.2 | 5.9 | 5.1 | 4.6 | 4.3 | 4.3 | 4.7 | 5.8 | 7.0 | 5.7 | 5.1 | 6.6 | 7.6 | 7.5 | 6.4 | 6.6 | 8.0 | 6.4 | 5.5 | 5.2 | 4.8 |
| 6.9 | 6.2 | 6.3 | 6.7 | 7.4 | 8.2 | 8.7 | 8.8 | 9.7 | 9.7 | 9.6 | 10.5 | 9.2 | 9.4 | 9.2 | 10.6 | 12.6 | 17.7 | 20.7 | 22.4 | 22.3 | 23.6 | 27.2 | 26.2 | 18.8 | 19.5 | 26.4 | 30.6 | 29.5 | 29.8 | 29.6 | 27.2 | 25.0 | 21.6 | 12.2 | 7.8 |
| 13.0 | 11.9 | 11.8 | 12.5 | 13.7 | 15.1 | 17.2 | 20.5 | 21.2 | 18.2 | 15.9 | 14.7 | 15.3 | 16.0 | 17.7 | 19.7 | 21.8 | 24.1 | 25.7 | 26.7 | 26.9 | 28.2 | 31.1 | 33.7 | 34.9 | 35.4 | 34.6 | 33.5 | 32.3 | 30.7 | 29.1 | 26.8 | 24.3 | 21.1 | 15.7 | 13.6 |

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



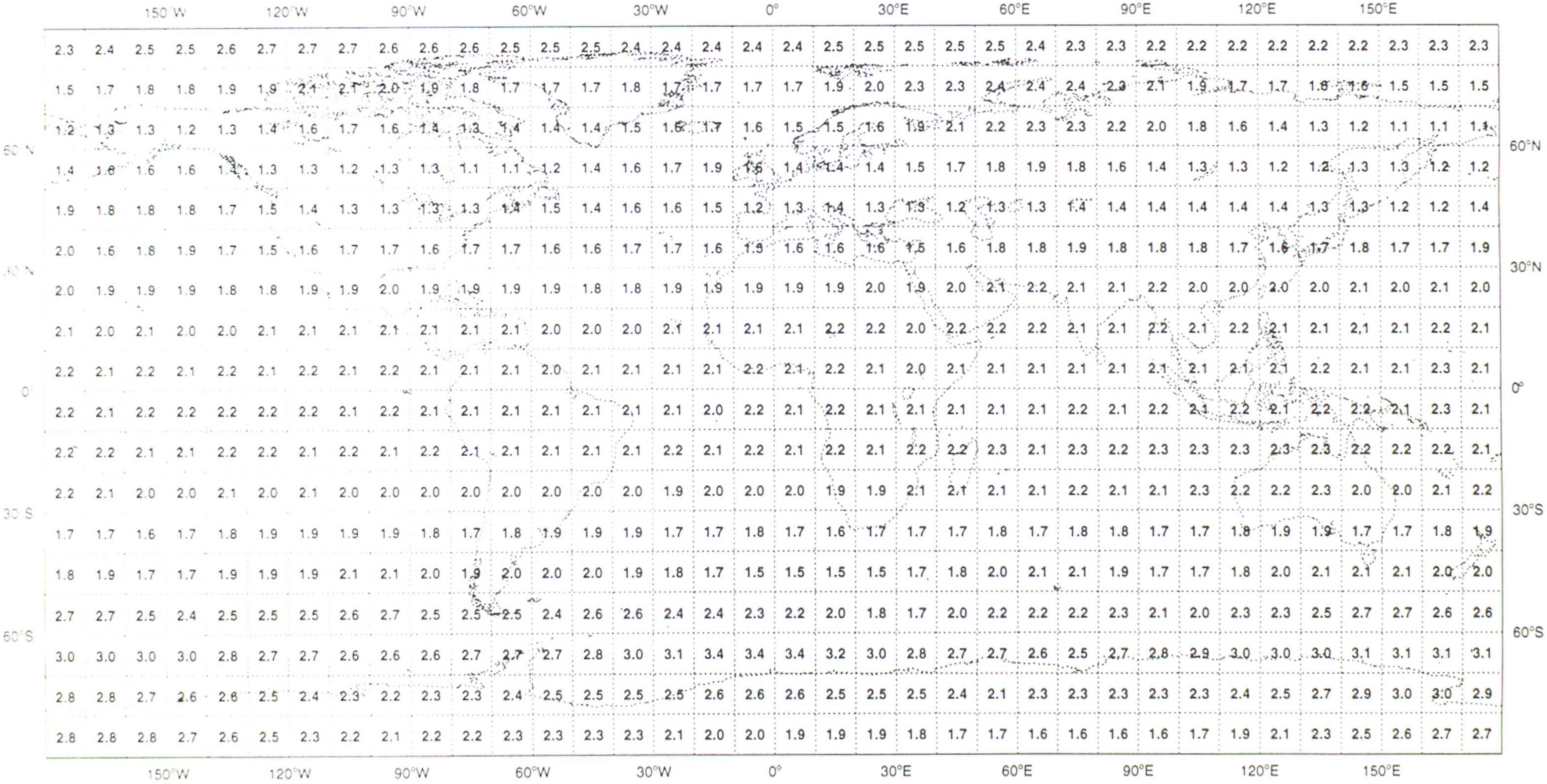
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.7 | 2.7 | 2.7 | 2.7 | 2.9 | 3.0 | 3.0 | 3.1 | 3.3 | 3.5 | 3.6 | 3.6 | 3.7 | 3.9 | 3.8 | 3.6 | 3.7 | 3.7 | 3.5 | 3.3 | 3.2 | 3.1 | 3.1 | 3.2 | 3.4 | 3.4 | 3.3 | 3.1 | 3.1 | 3.1 | 3.0 | 3.0 | 3.0 | 2.9 | 2.8 | 2.8 |
| 3.4 | 3.6 | 3.5 | 3.3 | 2.9 | 2.8 | 2.3 | 2.2 | 2.3 | 2.4 | 2.6 | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 | 3.2 | 3.0 | 2.9 | 3.2 | 3.2 | 2.9 | 2.8 | 2.7 | 2.8 | 2.8 | 2.9 | 2.9 | 2.9 | 3.0 | 3.1 | 2.8 | 2.9 | 2.9 | 2.8 | 2.8 |
| 3.2 | 4.0 | 4.4 | 4.3 | 3.8 | 3.4 | 3.5 | 3.0 | 2.6 | 2.5 | 2.6 | 2.7 | 3.2 | 3.3 | 3.4 | 3.1 | 3.1 | 3.1 | 3.2 | 4.2 | 4.3 | 3.3 | 2.8 | 2.6 | 2.7 | 3.0 | 3.3 | 3.2 | 3.3 | 3.5 | 3.5 | 3.0 | 2.7 | 2.9 | 2.8 | 2.9 |
| 2.7 | 3.1 | 3.5 | 3.0 | 3.7 | 3.3 | 3.5 | 3.9 | 3.4 | 2.9 | 3.1 | 2.9 | 3.0 | 3.1 | 2.9 | 2.9 | 3.1 | 3.1 | 3.3 | 3.8 | 3.8 | 3.7 | 3.2 | 3.0 | 3.4 | 3.6 | 3.7 | 3.7 | 4.1 | 4.0 | 4.1 | 3.8 | 3.4 | 3.8 | 2.9 | 2.5 |
| 3.7 | 3.7 | 3.4 | 3.5 | 4.0 | 3.7 | 3.4 | 3.5 | 3.9 | 4.0 | 4.1 | 3.9 | 3.8 | 3.9 | 3.8 | 3.3 | 3.3 | 3.5 | 4.3 | 3.9 | 4.1 | 3.5 | 3.4 | 3.7 | 4.1 | 3.9 | 4.2 | 4.4 | 4.4 | 3.9 | 4.2 | 4.0 | 3.7 | 4.2 | 3.5 | 3.2 |
| 4.0 | 3.8 | 3.5 | 3.7 | 4.5 | 4.2 | 5.0 | 4.4 | 4.1 | 4.4 | 4.4 | 4.8 | 5.1 | 4.7 | 4.4 | 4.6 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 6.0 | 5.4 | 5.6 | 5.8 | 5.4 | 4.5 | 4.3 | 4.1 | 4.0 | 4.2 | 4.4 | 4.4 | 4.1 | 3.5 | 3.5 |
| 3.7 | 3.5 | 3.6 | 4.3 | 4.8 | 4.9 | 4.4 | 3.7 | 5.6 | 5.0 | 5.0 | 5.2 | 4.4 | 4.0 | 4.7 | 4.6 | 4.5 | 4.8 | 4.9 | 5.3 | 4.9 | 4.9 | 4.5 | 5.5 | 5.3 | 4.7 | 4.5 | 3.9 | 3.8 | 3.6 | 3.5 | 3.5 | 3.2 | 3.9 | 4.0 | 3.5 |
| 3.9 | 4.2 | 4.8 | 4.4 | 4.0 | 3.9 | 3.1 | 3.4 | 4.7 | 5.1 | 5.2 | 4.6 | 4.2 | 3.8 | 3.7 | 3.5 | 3.2 | 3.1 | 3.4 | 3.7 | 4.9 | 5.4 | 3.9 | 4.8 | 5.9 | 4.5 | 4.1 | 3.7 | 2.9 | 3.3 | 3.5 | 3.5 | 3.6 | 4.0 | 4.1 | 3.2 |
| 2.9 | 3.2 | 3.4 | 3.2 | 3.1 | 2.9 | 3.5 | 3.7 | 3.4 | 3.1 | 2.5 | 2.5 | 2.7 | 2.7 | 2.9 | 3.0 | 3.1 | 2.8 | 2.7 | 3.7 | 2.9 | 3.7 | 3.2 | 2.9 | 2.8 | 2.8 | 2.3 | 2.3 | 2.9 | 2.6 | 2.6 | 2.3 | 1.9 | 2.0 | 2.4 | 2.7 |
| 3.2 | 3.6 | 3.5 | 2.9 | 2.9 | 3.2 | 3.2 | 3.0 | 3.2 | 3.5 | 3.0 | 2.8 | 3.6 | 3.8 | 3.3 | 3.1 | 3.3 | 3.3 | 3.4 | 3.9 | 4.2 | 3.8 | 3.4 | 3.3 | 3.2 | 2.9 | 2.8 | 2.7 | 3.6 | 3.8 | 3.6 | 3.9 | 3.2 | 2.2 | 2.7 | 2.6 |
| 3.9 | 3.5 | 3.7 | 4.0 | 4.2 | 3.9 | 2.9 | 2.6 | 2.9 | 3.3 | 4.1 | 3.6 | 4.6 | 4.0 | 4.2 | 5.1 | 4.1 | 3.8 | 3.3 | 3.3 | 2.9 | 3.3 | 3.1 | 3.9 | 4.1 | 4.6 | 4.4 | 4.4 | 4.4 | 3.8 | 3.4 | 3.5 | 4.3 | 4.6 | 3.4 | 3.7 |
| 4.2 | 3.9 | 4.2 | 4.8 | 5.1 | 4.9 | 4.6 | 4.6 | 4.4 | 4.6 | 5.1 | 4.7 | 4.7 | 5.2 | 5.0 | 5.5 | 5.2 | 4.5 | 4.3 | 4.5 | 4.5 | 4.1 | 3.4 | 4.9 | 4.8 | 3.8 | 4.3 | 4.9 | 5.2 | 5.3 | 4.4 | 4.2 | 3.7 | 3.7 | 4.4 | 4.5 |
| 4.5 | 4.4 | 3.9 | 3.9 | 4.5 | 4.8 | 5.1 | 4.6 | 4.2 | 4.8 | 5.5 | 4.8 | 5.1 | 4.6 | 4.5 | 4.6 | 4.5 | 4.4 | 4.6 | 5.2 | 5.0 | 4.8 | 4.6 | 4.9 | 4.5 | 4.1 | 4.2 | 4.7 | 5.0 | 4.8 | 4.2 | 3.9 | 4.1 | 4.8 | 4.8 | 4.7 |
| 3.5 | 3.4 | 3.3 | 3.7 | 4.4 | 4.2 | 4.1 | 3.8 | 3.6 | 3.6 | 3.4 | 3.7 | 3.8 | 3.7 | 3.8 | 4.1 | 3.9 | 3.9 | 3.6 | 3.7 | 3.7 | 3.4 | 3.4 | 3.6 | 3.4 | 3.4 | 3.3 | 3.3 | 3.4 | 3.6 | 3.7 | 3.7 | 3.9 | 4.1 | 4.0 | 3.5 |
| 3.2 | 3.3 | 3.0 | 3.2 | 3.3 | 3.7 | 4.0 | 3.4 | 3.2 | 3.6 | 3.4 | 2.9 | 2.8 | 2.8 | 3.1 | 3.1 | 3.1 | 2.9 | 2.8 | 3.0 | 2.9 | 2.9 | 2.9 | 2.8 | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 3.0 | 3.1 | 3.4 | 3.3 | 3.3 | 3.4 | 2.9 |
| 2.7 | 2.9 | 3.0 | 3.0 | 3.0 | 3.2 | 3.5 | 3.3 | 3.0 | 3.0 | 2.9 | 3.4 | 3.0 | 2.9 | 3.0 | 3.1 | 2.9 | 2.8 | 2.6 | 2.8 | 2.9 | 3.0 | 4.3 | 5.5 | 4.3 | 2.9 | 4.3 | 5.2 | 5.5 | 5.1 | 5.9 | 6.9 | 5.1 | 4.1 | 3.2 | 3.0 |
| 2.8 | 2.8 | 2.7 | 3.0 | 4.1 | 5.2 | 5.7 | 5.9 | 6.0 | 5.5 | 4.2 | 3.6 | 2.9 | 3.4 | 3.3 | 4.1 | 5.4 | 7.4 | 8.4 | 9.2 | 9.9 | 9.8 | 9.5 | 7.2 | 8.5 | 8.5 | 7.7 | 7.9 | 6.5 | 6.6 | 5.5 | 4.0 | 4.6 | 5.4 | 5.7 | 2.9 |
| 7.7 | 7.0 | 6.8 | 6.6 | 6.6 | 6.7 | 6.7 | 6.4 | 5.9 | 5.3 | 5.6 | 6.1 | 6.3 | 6.3 | 6.1 | 5.2 | 5.0 | 5.1 | 5.7 | 5.9 | 5.8 | 6.1 | 7.0 | 7.8 | 7.7 | 7.7 | 7.3 | 6.5 | 5.7 | 5.2 | 4.7 | 4.7 | 5.1 | 6.0 | 8.0 | 7.8 |

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.1 | -6.0 | -6.0 | -6.0 | -5.9 | -5.9 | -5.9 | -5.8 | -5.8 | -5.8 | -5.7 | -5.7 | -5.7 | -5.7 | -5.7 | -5.8 | -5.8 | -5.9 | -5.9 | -5.9 | -5.9 | -5.9 | -5.9 | -5.9 | -5.9 | -6.0 | -6.0 |
| -5.6 | -5.5 | -5.4 | -5.3 | -5.3 | -5.4 | -5.5 | -5.6 | -5.7 | -5.7 | -5.7 | -5.7 | -5.5 | -5.3 | -5.1 | -5.3 | -5.3 | -5.3 | -5.3 | -5.2 | -5.1 | -5.1 | -5.1 | -5.2 | -5.4 | -5.5 | -5.7 | -5.8 | -5.9 | -6.0 | -6.0 | -5.8 | -5.7 | -5.6 | -5.6 | -5.6 |
| -4.7 | -4.6 | -4.4 | -4.2 | -4.1 | -4.1 | -4.2 | -4.4 | -4.6 | -4.8 | -5.0 | -5.1 | -5.0 | -4.7 | -4.7 | -4.8 | -4.8 | -4.8 | -4.5 | -4.1 | -3.9 | -4.0 | -4.3 | -4.5 | -4.6 | -4.5 | -4.4 | -4.3 | -4.3 | -4.5 | -4.7 | -4.6 | -4.7 | -4.8 | -4.9 | -4.9 |
| -4.6 | -4.6 | -3.9 | -4.0 | -3.8 | -3.5 | -3.5 | -3.5 | -3.7 | -4.0 | -4.3 | -4.6 | -4.7 | -4.6 | -4.4 | -4.5 | -4.6 | -4.4 | -3.9 | -3.4 | -3.3 | -3.3 | -3.7 | -4.0 | -4.0 | -3.7 | -3.4 | -3.3 | -3.3 | -3.5 | -3.7 | -3.8 | -3.7 | -4.2 | -4.9 | -5.0 |
| -4.0 | -3.5 | -3.6 | -3.6 | -3.4 | -3.4 | -3.3 | -3.4 | -3.3 | -3.5 | -3.8 | -3.8 | -3.7 | -3.6 | -3.6 | -3.7 | -3.7 | -3.8 | -3.5 | -3.4 | -3.3 | -3.3 | -3.5 | -3.5 | -3.5 | -3.4 | -3.3 | -3.4 | -3.4 | -3.4 | -3.6 | -3.7 | -3.7 | -3.6 | -4.0 | -3.9 |
| -3.8 | -3.4 | -3.2 | -3.4 | -3.2 | -3.4 | -3.5 | -3.6 | -3.4 | -3.5 | -3.5 | -3.3 | -3.1 | -3.0 | -3.0 | -3.1 | -3.3 | -3.5 | -3.1 | -3.5 | -3.3 | -3.7 | -3.9 | -4.0 | -4.1 | -4.0 | -3.7 | -3.8 | -3.8 | -3.9 | -3.9 | -4.0 | -4.2 | -3.8 | -3.8 | -3.5 |
| -3.8 | -3.7 | -3.4 | -3.4 | -3.5 | -3.5 | -3.7 | -4.1 | -4.0 | -4.0 | -3.8 | -3.5 | -3.2 | -2.9 | -3.1 | -3.3 | -3.5 | -3.6 | -3.3 | -3.6 | -3.8 | -4.5 | -4.7 | -5.0 | -5.2 | -5.3 | -5.2 | -5.0 | -4.8 | -4.6 | -4.5 | -4.5 | -4.5 | -4.0 | -3.9 | -3.8 |
| -4.1 | -4.3 | -4.0 | -4.0 | -4.3 | -4.3 | -4.4 | -4.5 | -4.5 | -4.5 | -4.1 | -4.1 | -4.0 | -3.7 | -3.8 | -4.0 | -4.1 | -4.0 | -4.1 | -4.5 | -4.6 | -4.8 | -5.0 | -5.2 | -5.1 | -5.2 | -5.3 | -5.1 | -5.0 | -4.8 | -4.9 | -4.8 | -4.8 | -4.4 | -4.1 | -4.4 |
| -4.3 | -4.8 | -4.5 | -4.5 | -4.6 | -4.4 | -4.6 | -4.6 | -4.5 | -4.7 | -4.3 | -4.4 | -4.3 | -4.2 | -4.3 | -4.3 | -4.4 | -4.2 | -4.5 | -4.3 | -4.4 | -4.4 | -4.6 | -4.5 | -4.4 | -4.4 | -4.6 | -4.4 | -4.5 | -4.5 | -4.4 | -4.3 | -4.3 | -4.6 | -4.2 | -4.6 |
| -4.4 | -4.7 | -4.7 | -4.7 | -4.8 | -4.7 | -4.7 | -4.7 | -4.5 | -4.6 | -4.4 | -4.3 | -4.3 | -4.3 | -4.3 | -4.2 | -4.4 | -4.1 | -4.6 | -4.1 | -4.4 | -4.4 | -4.4 | -4.5 | -4.3 | -4.3 | -4.4 | -4.3 | -4.5 | -4.6 | -4.6 | -4.4 | -4.4 | -4.6 | -4.4 | -4.6 |
| -4.3 | -4.4 | -4.3 | -4.3 | -4.1 | -4.0 | -4.2 | -4.1 | -4.1 | -4.1 | -4.0 | -3.9 | -3.9 | -3.9 | -3.8 | -3.8 | -4.0 | -3.7 | -4.2 | -3.7 | -4.1 | -4.1 | -4.1 | -4.2 | -4.2 | -4.2 | -4.3 | -4.3 | -4.3 | -4.4 | -4.4 | -4.3 | -4.2 | -4.3 | -4.1 | -4.4 |
| -3.3 | -3.3 | -3.3 | -3.1 | -2.9 | -2.7 | -2.7 | -2.5 | -2.5 | -2.5 | -2.7 | -2.7 | -2.8 | -2.9 | -2.9 | -2.9 | -2.8 | -2.7 | -2.9 | -2.5 | -2.8 | -3.0 | -2.9 | -3.0 | -2.9 | -3.0 | -3.3 | -3.1 | -2.9 | -2.9 | -2.6 | -2.5 | -2.5 | -2.6 | -3.0 | -3.2 |
| -1.2 | -1.2 | -1.6 | -1.5 | -1.4 | -1.4 | -1.3 | -.9 | -1.0 | -.9 | -.9 | -.9 | -1.1 | -1.4 | -1.6 | -1.8 | -1.7 | -2.0 | -1.9 | -2.0 | -2.2 | -2.2 | -2.0 | -1.9 | -1.7 | -1.7 | -1.7 | -1.6 | -1.4 | -1.1 | -.8 | -.6 | -.4 | -.5 | -.7 | -.7 |
| .6 | .3 | .0 | -.2 | -.1 | .2 | .4 | .6 | .8 | 1.0 | 1.0 | 1.2 | 1.0 | .7 | .3 | -.2 | -.4 | -1.1 | -1.3 | -1.8 | -1.9 | -1.8 | -1.7 | -1.7 | -1.8 | -1.9 | -1.8 | -1.4 | -.8 | -.1 | .5 | .9 | 1.2 | 1.2 | 1.2 | 1.2 |
| 3.0 | 2.5 | 2.2 | 1.9 | 2.1 | 2.6 | 2.9 | 2.9 | 3.2 | 3.4 | 3.7 | 3.8 | 3.7 | 3.7 | 3.4 | 3.0 | 2.5 | 1.7 | 1.0 | .3 | -.1 | -.4 | -.5 | -.6 | -.7 | -.9 | -.6 | -.1 | .6 | 1.4 | 2.1 | 2.8 | 3.2 | 3.2 | 3.2 | 3.3 |
| 6.1 | 5.9 | 5.6 | 5.2 | 5.0 | 5.4 | 5.7 | 6.0 | 6.3 | 6.5 | 6.7 | 6.8 | 7.1 | 7.3 | 7.4 | 7.2 | 6.8 | 6.1 | 5.3 | 4.7 | 4.4 | 4.1 | 4.0 | 4.0 | 3.9 | 3.9 | 4.2 | 4.6 | 5.0 | 5.3 | 5.6 | 6.1 | 6.1 | 6.0 | 6.1 | 6.1 |
| 8.4 | 8.3 | 8.5 | 8.6 | 8.7 | 8.7 | 8.8 | 8.8 | 9.0 | 9.2 | 9.4 | 9.7 | 9.9 | 10.0 | 10.2 | 10.3 | 10.4 | 10.7 | 10.9 | 11.1 | 11.1 | 11.1 | 11.3 | 10.9 | 10.0 | 10.0 | 10.9 | 11.7 | 11.6 | 11.6 | 11.4 | 11.0 | 10.4 | 9.8 | 9.0 | 8.6 |
| 10.7 | 10.6 | 10.6 | 10.8 | 11.0 | 11.2 | 11.5 | 11.8 | 11.9 | 11.8 | 11.7 | 11.6 | 11.6 | 11.6 | 11.7 | 11.9 | 12.1 | 12.3 | 12.5 | 12.7 | 12.9 | 13.3 | 13.7 | 14.2 | 14.3 | 14.4 | 14.2 | 14.0 | 13.7 | 13.4 | 13.0 | 12.5 | 12.1 | 11.6 | 11.1 | 10.8 |

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 |
| 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 2.1 | 2.1 | 2.0 | 1.9 | 1.8 | 1.7 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 1.9 | 2.0 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.1 | 1.9 | 1.7 | 1.7 | 1.8 | 1.6 | 1.5 | 1.5 | 1.5 |
| 1.2 | 1.3 | 1.3 | 1.2 | 1.3 | 1.4 | 1.6 | 1.7 | 1.6 | 1.4 | 1.3 | 1.4 | 1.4 | 1.4 | 1.5 | 1.6 | 1.7 | 1.6 | 1.5 | 1.5 | 1.6 | 1.9 | 2.1 | 2.2 | 2.3 | 2.3 | 2.2 | 2.0 | 1.8 | 1.6 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 |
| 1.4 | 1.6 | 1.6 | 1.6 | 1.4 | 1.3 | 1.3 | 1.2 | 1.3 | 1.3 | 1.1 | 1.1 | 1.2 | 1.4 | 1.6 | 1.7 | 1.9 | 1.6 | 1.4 | 1.4 | 1.4 | 1.5 | 1.7 | 1.8 | 1.9 | 1.8 | 1.6 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 |
| 1.9 | 1.8 | 1.8 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.5 | 1.4 | 1.6 | 1.6 | 1.5 | 1.2 | 1.3 | 1.4 | 1.3 | 1.3 | 1.2 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.4 |
| 2.0 | 1.6 | 1.8 | 1.9 | 1.7 | 1.5 | 1.6 | 1.7 | 1.7 | 1.6 | 1.7 | 1.7 | 1.6 | 1.6 | 1.7 | 1.7 | 1.6 | 1.5 | 1.6 | 1.6 | 1.6 | 1.5 | 1.6 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.7 | 1.6 | 1.7 | 1.8 | 1.7 | 1.7 | 1.9 |
| 2.0 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 1.9 | 2.0 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.0 |
| 2.1 | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.0 | 2.2 | 2.2 | 2.2 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 |
| 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 2.3 | 2.1 |
| 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.2 | 2.1 | 2.3 | 2.1 |
| 2.2 | 2.2 | 2.1 | 2.1 | 2.2 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2 | 2.2 | 2.3 | 2.1 | 2.3 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 |
| 2.2 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 2.3 | 2.2 | 2.2 | 2.3 | 2.0 | 2.0 | 2.1 | 2.2 |
| 1.7 | 1.7 | 1.6 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.7 | 1.7 | 1.8 | 1.7 | 1.6 | 1.7 | 1.7 | 1.7 | 1.8 | 1.7 | 1.8 | 1.8 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 1.7 | 1.7 | 1.8 | 1.9 |
| 1.8 | 1.9 | 1.7 | 1.7 | 1.9 | 1.9 | 1.9 | 2.1 | 2.1 | 2.0 | 1.9 | 2.0 | 2.0 | 2.0 | 1.9 | 1.8 | 1.7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.7 | 1.8 | 2.0 | 2.1 | 2.1 | 1.9 | 1.7 | 1.7 | 1.8 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 |
| 2.7 | 2.7 | 2.5 | 2.4 | 2.5 | 2.5 | 2.5 | 2.6 | 2.7 | 2.5 | 2.5 | 2.5 | 2.4 | 2.6 | 2.6 | 2.4 | 2.4 | 2.3 | 2.2 | 2.0 | 1.8 | 1.7 | 2.0 | 2.2 | 2.2 | 2.2 | 2.3 | 2.1 | 2.0 | 2.3 | 2.3 | 2.5 | 2.7 | 2.7 | 2.6 | 2.6 |
| 3.0 | 3.0 | 3.0 | 3.0 | 2.8 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.7 | 2.7 | 2.7 | 2.8 | 3.0 | 3.1 | 3.4 | 3.4 | 3.4 | 3.2 | 3.0 | 2.8 | 2.7 | 2.7 | 2.6 | 2.5 | 2.7 | 2.8 | 2.9 | 3.0 | 3.0 | 3.0 | 3.1 | 3.1 | 3.1 | 3.1 |
| 2.8 | 2.8 | 2.7 | 2.6 | 2.8 | 2.5 | 2.4 | 2.3 | 2.2 | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 2.6 | 2.5 | 2.5 | 2.5 | 2.4 | 2.1 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.5 | 2.7 | 2.9 | 3.0 | 3.0 | 2.9 |
| 2.8 | 2.8 | 2.8 | 2.7 | 2.6 | 2.5 | 2.3 | 2.2 | 2.1 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.1 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.8 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 | 1.9 | 2.1 | 2.3 | 2.5 | 2.6 | 2.7 | 2.7 |

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

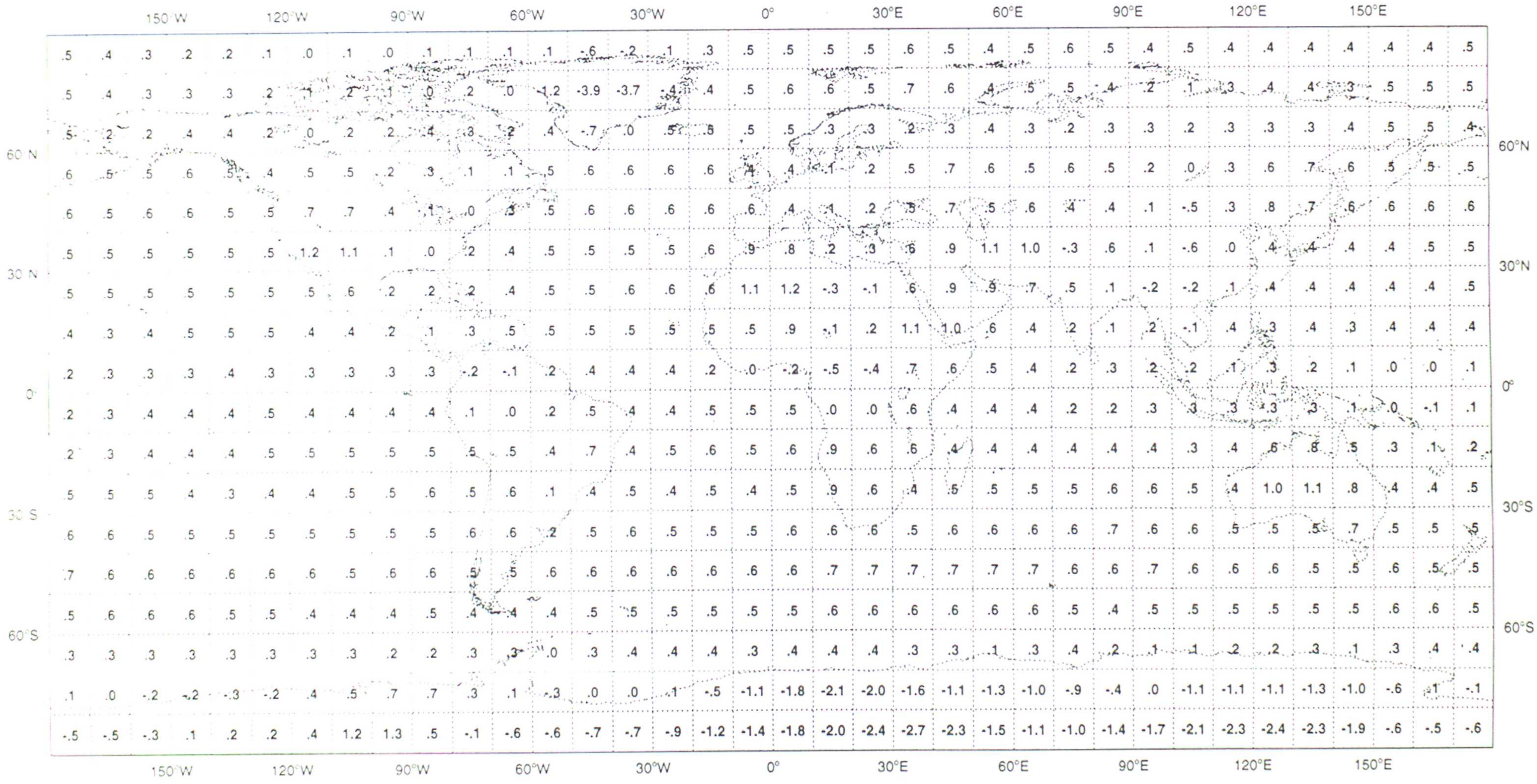

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

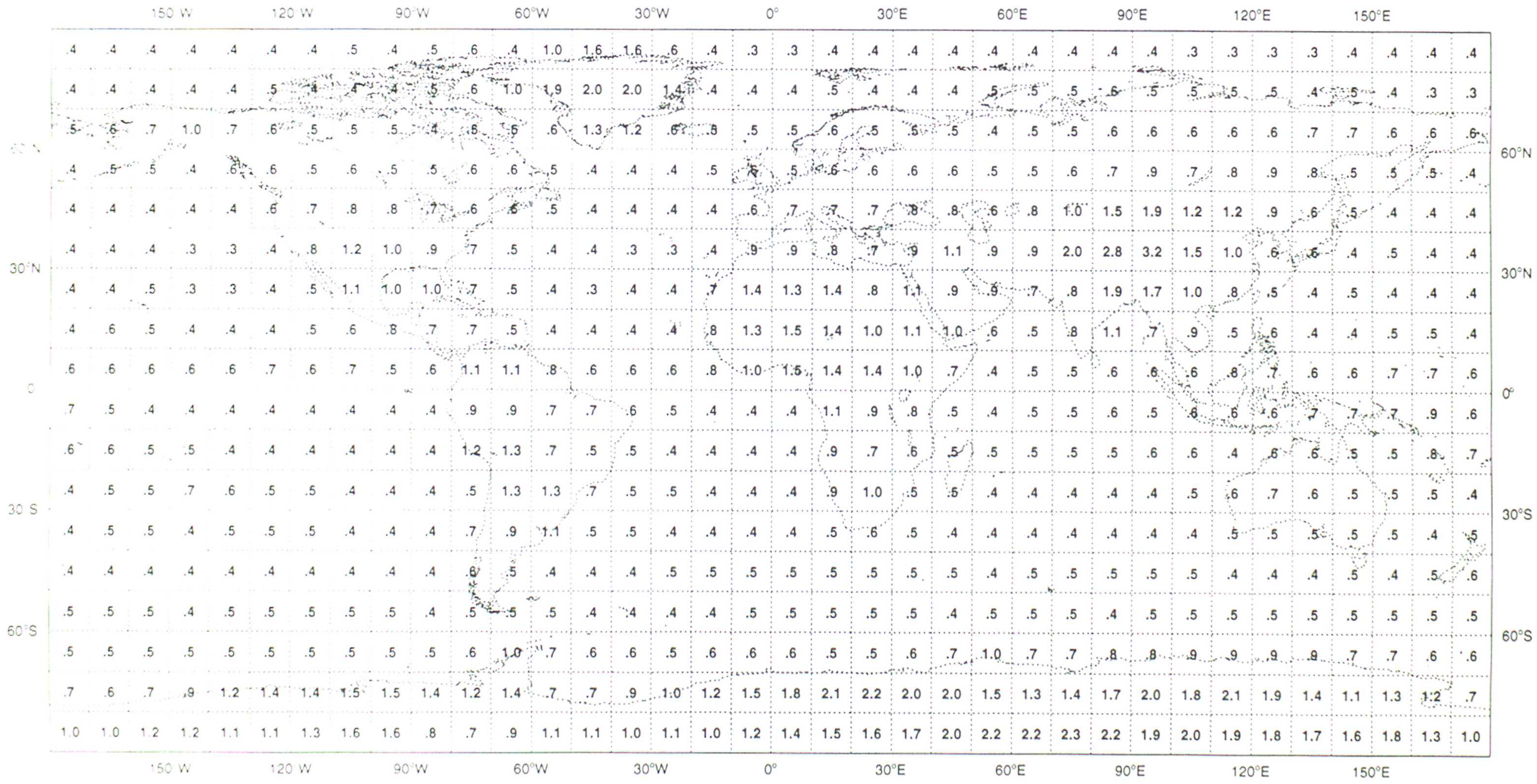

150 W
120 W
90 W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .6 .4 1.0 1.6 1.6 .6 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4
.4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .6 1.0 1.9 2.0 2.0 1.4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .5 .6 .5 .5 .5 .5 .4 .5 .4 .3 .3
.5 .6 .7 1.0 .7 .6 .5 .5 .5 .4 .5 .5 .6 1.3 1.2 .6 .5 .5 .5 .6 .5 .5 .5 .4 .5 .5 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6
.4 .5 .5 .4 .6 .6 .5 .6 .5 .5 .6 .6 .5 .4 .4 .4 .5 .6 .5 .6 .6 .6 .6 .5 .5 .6 .7 .9 .7 .8 .9 .8 .5 .5 .5 .4
.4 .4 .4 .4 .4 .6 .7 .8 .8 .7 .6 .6 .5 .4 .4 .4 .4 .6 .7 .7 .7 .8 .8 .6 .8 1.0 1.5 1.9 1.2 1.2 .9 .6 .5 .4 .4 .4
.4 .4 .4 .3 .3 .4 .8 1.2 1.0 .9 .7 .5 .4 .4 .3 .3 .4 .9 .9 .8 .7 .9 1.1 .9 .9 2.0 2.8 3.2 1.5 1.0 .6 .6 .4 .5 .4 .4
.4 .4 .5 .3 .3 .4 .5 1.1 1.0 1.0 .7 .5 .4 .3 .4 .4 .7 1.4 1.3 1.4 .8 1.1 .9 .9 .7 .8 1.9 1.7 1.0 .8 .5 .4 .5 .4 .4 .4
.4 .6 .5 .4 .4 .4 .5 .6 .8 .7 .7 .5 .4 .4 .4 .4 .8 1.3 1.5 1.4 1.0 1.1 1.0 .6 .5 .8 1.1 .7 .9 .5 .6 .4 .4 .5 .5 .4
.6 .6 .6 .6 .6 .7 .6 .7 .5 .6 1.1 1.1 .8 .6 .6 .6 .8 1.0 1.5 1.4 1.4 1.0 .7 .4 .5 .5 .6 .6 .6 .8 .7 .6 .6 .7 .7 .6
.7 .5 .4 .4 .4 .4 .4 .4 .4 .4 .9 .9 .7 .7 .6 .5 .4 .4 .4 1.1 .9 .8 .5 .4 .5 .5 .6 .5 .6 .6 .6 .7 .7 .7 .9 .6
.6 .6 .5 .5 .4 .4 .4 .4 .4 .4 1.2 1.3 .7 .5 .5 .4 .4 .4 .4 .9 .7 .6 .5 .5 .5 .5 .5 .6 .6 .4 .6 .6 .5 .5 .8 .7
.4 .5 .5 .7 .6 .5 .5 .4 .4 .4 .5 1.3 1.3 .7 .5 .5 .4 .4 .4 .9 1.0 .5 .5 .4 .4 .4 .4 .4 .5 .6 .7 .6 .5 .5 .5 .4
.4 .5 .5 .4 .5 .5 .5 .4 .4 .4 .7 .9 1.1 .5 .5 .4 .4 .4 .4 .5 .6 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .4 .4 .4 .5 .4 .5 .6
.5 .5 .5 .4 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 1.0 .7 .6 .6 .5 .6 .6 .6 .5 .5 .6 .7 1.0 .7 .7 .8 .8 .9 .9 .9 .9 .7 .7 .6 .6
.7 .6 .7 .9 1.2 1.4 1.4 1.5 1.5 1.4 1.2 1.4 .7 .7 .9 1.0 1.2 1.5 1.8 2.1 2.2 2.0 2.0 1.5 1.3 1.4 1.7 2.0 1.8 2.1 1.9 1.4 1.1 1.3 1.2 .7
1.0 1.0 1.2 1.2 1.1 1.1 1.3 1.6 1.6 .8 .7 .9 1.1 1.1 1.0 1.1 1.0 1.2 1.4 1.5 1.6 1.7 2.0 2.2 2.2 2.3 2.2 1.9 2.0 1.9 1.8 1.7 1.6 1.8 1.3 1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C).  MAY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

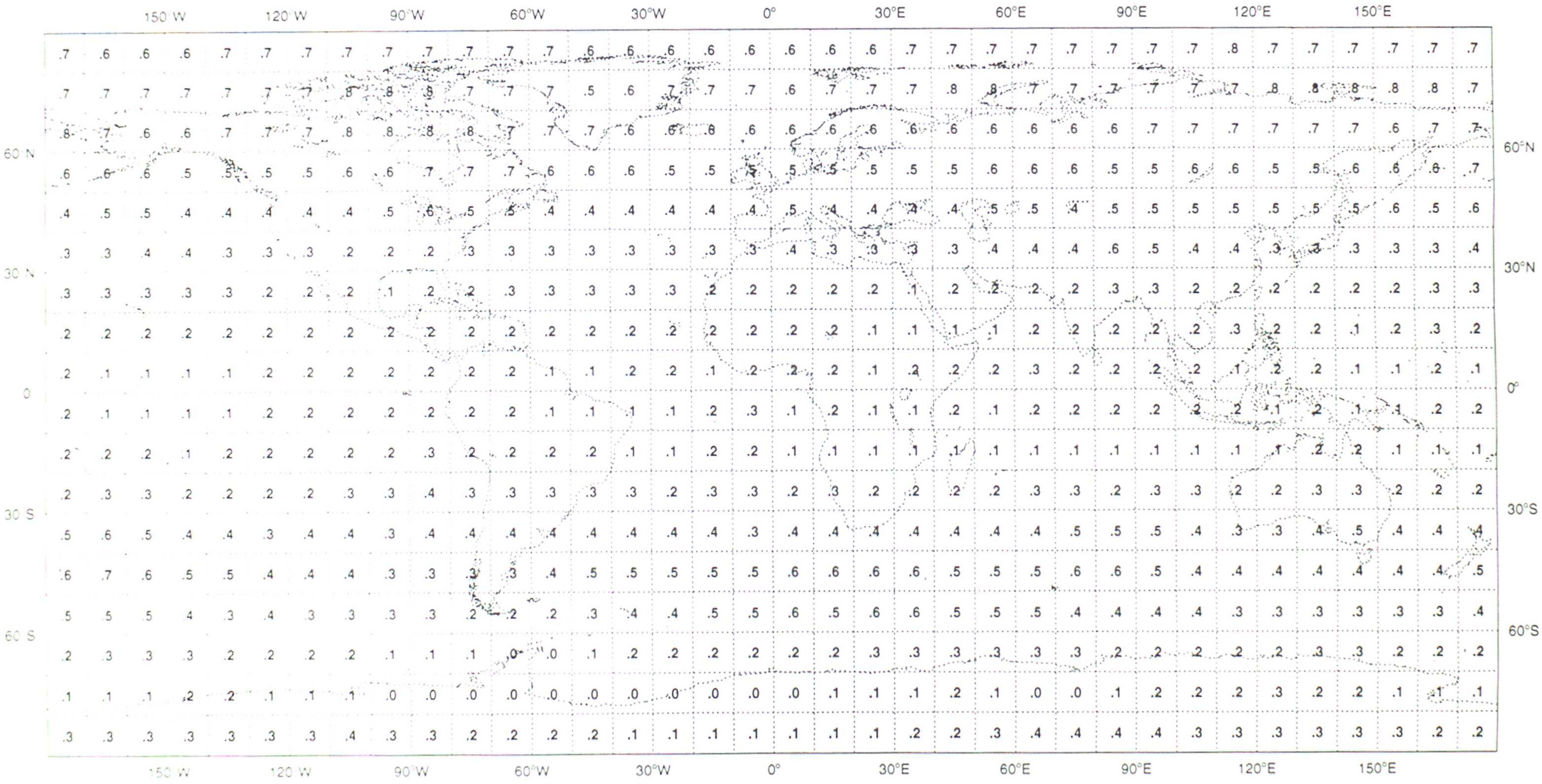

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60 N
30 N
0
30 S
60 S
60°N
30°N
0°
30°S
60°S
.7 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .8 .7 .7 .7 .7 .7 .7
.7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .7 .7 .7 .5 .6 .7 .7 .7 .6 .7 .7 .7 .8 .8 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .7
.8 .7 .6 .6 .7 .7 .7 .8 .8 .8 .8 .7 .7 .7 .6 .6 .8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .6 .7 .7
.6 .6 .6 .5 .5 .5 .5 .6 .6 .7 .7 .7 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .6 .6 .5 .5 .6 .6 .6 .7
.4 .5 .5 .4 .4 .4 .4 .4 .5 .6 .5 .5 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .6 .5 .6
.3 .3 .4 .4 .3 .3 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .4 .6 .5 .4 .4 .3 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .2 .2 .2 .1 .2 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .1 .2 .2 .2 .2 .3 .3 .2 .2 .2 .2 .2 .2 .3 .3
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .3 .2 .2 .1 .2 .3 .2
.2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .1 .1 .2 .2 .1 .2 .2 .2 .1 .2 .2 .2 .3 .2 .2 .2 .2 .1 .2 .2 .1 .1 .2 .1
.2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .2 .3 .1 .2 .1 .1 .2 .1 .2 .2 .2 .2 .2 .2 .1 .2 .1 .1 .2 .2
.2 .2 .2 .1 .2 .2 .2 .2 .2 .3 .2 .2 .2 .2 .1 .1 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .1 .1 .1
.2 .3 .3 .2 .2 .2 .2 .3 .3 .4 .3 .3 .3 .3 .3 .2 .3 .3 .2 .3 .2 .2 .2 .2 .3 .3 .2 .3 .3 .2 .2 .3 .3 .2 .2 .2
.5 .6 .5 .4 .4 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .3 .3 .4 .5 .4 .4 .4
.6 .7 .6 .5 .5 .4 .4 .4 .3 .3 .3 .3 .4 .5 .5 .5 .5 .5 .6 .6 .6 .6 .5 .5 .5 .6 .6 .5 .4 .4 .4 .4 .4 .4 .4 .5
.5 .5 .5 .4 .3 .4 .3 .3 .3 .3 .2 .2 .2 .3 .4 .4 .5 .5 .6 .5 .6 .6 .5 .5 .5 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4
.2 .3 .3 .3 .2 .2 .2 .2 .1 .1 .1 .0 .0 .1 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .3 .2 .2 .2
.1 .1 .1 .2 .2 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .1 .1 .2 .1 .0 .0 .1 .2 .2 .2 .3 .2 .2 .1 .1 .1
.3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1 .1 .2 .2 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .2 .2
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

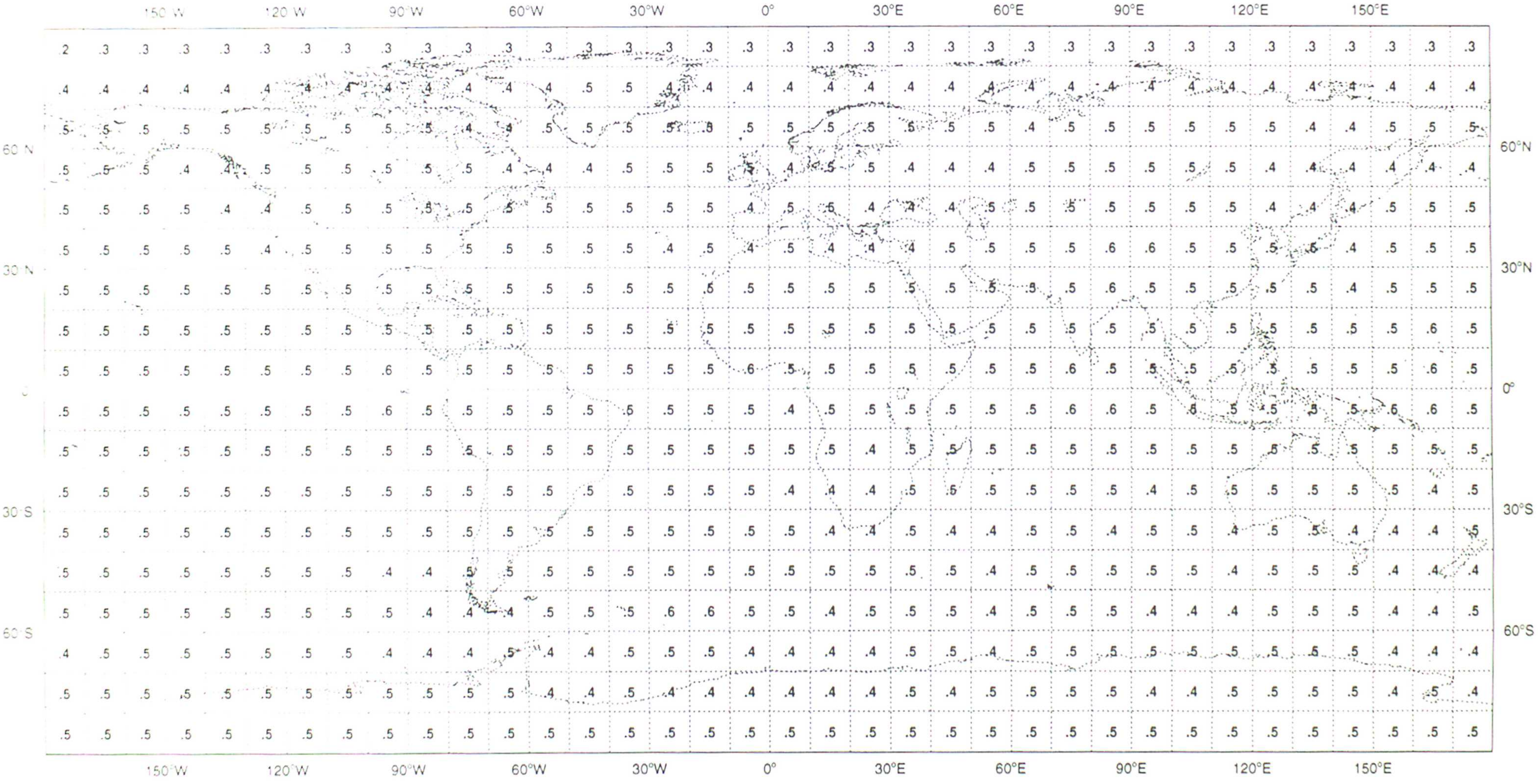

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5
.5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .4 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .6 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5
.5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .4 .4 .4 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .4 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .4 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .6 .6 .5 .6 .5 .5 .5 .5 .6 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .4 .5 .5 .4 .5 .5 .4 .5 .5 .4 .4 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .6 .6 .5 .5 .4 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4 .5 .5 .5 .4 .4 .5
.4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .4 .4 .5 .5 .5 .4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .4 .5 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002

Channel: AMSUA-9 (100 hPa)

NOAA15, using all observations

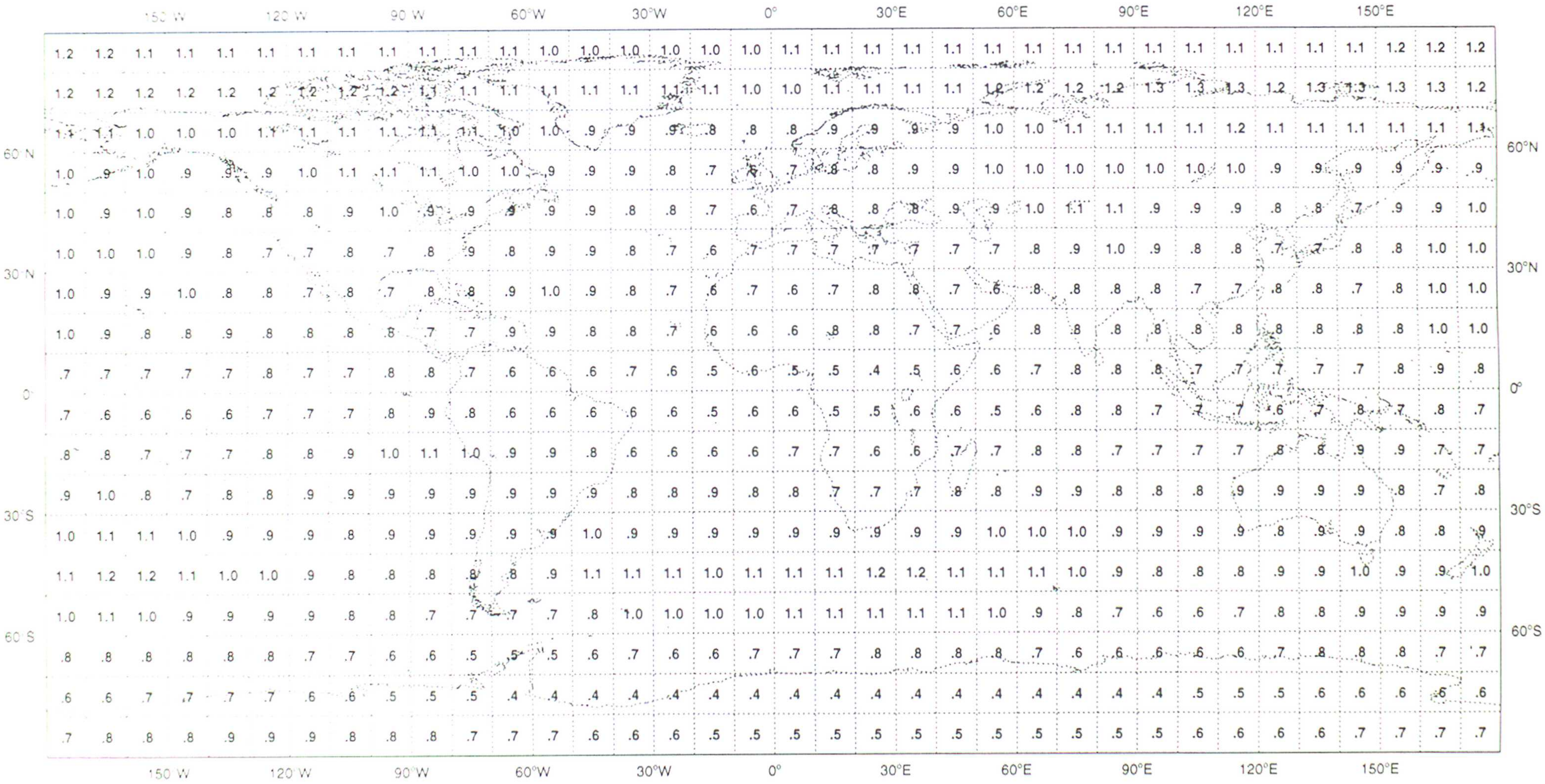

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.2
1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.1 1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.3 1.3 1.3 1.2 1.3 1.3 1.3 1.3 1.2
1.1 1.1 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 .9 .9 .9 .8 .8 .8 .9 .9 .9 .9 1.0 1.0 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.1 1.1
1.0 .9 1.0 .9 .9 .9 1.0 1.1 1.1 1.1 1.0 1.0 .9 .9 .9 .8 .7 .6 .7 .8 .8 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .9 .9
1.0 .9 1.0 .9 .8 .8 .8 .9 1.0 .9 .9 .9 .9 .9 .8 .8 .7 .6 .7 .8 .8 .8 .9 .9 1.0 1.1 1.1 .9 .9 .9 .8 .8 .7 .9 .9 1.0
1.0 1.0 1.0 .9 .8 .7 .7 .8 .7 .8 .9 .8 .9 .9 .8 .7 .6 .7 .7 .7 .7 .7 .7 .7 .8 .9 1.0 .9 .8 .8 .7 .7 .8 .8 1.0 1.0
1.0 .9 .9 1.0 .8 .8 .7 .8 .7 .8 .8 .9 1.0 .9 .8 .7 .6 .7 .6 .7 .8 .8 .7 .6 .8 .8 .8 .8 .7 .7 .8 .8 .7 .8 1.0 1.0
1.0 .9 .8 .8 .9 .8 .8 .8 .8 .7 .7 .9 .9 .8 .8 .7 .6 .6 .6 .8 .8 .7 .7 .6 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 1.0 1.0
.7 .7 .7 .7 .7 .8 .7 .7 .8 .8 .7 .6 .6 .6 .7 .6 .5 .6 .5 .5 .4 .5 .6 .6 .7 .8 .8 .8 .7 .7 .7 .7 .7 .8 .9 .8
.7 .6 .6 .6 .6 .7 .7 .7 .8 .9 .8 .6 .6 .6 .6 .6 .5 .6 .6 .5 .5 .6 .6 .5 .6 .8 .8 .7 .7 .7 .6 .7 .8 .7 .8 .7
.8 .8 .7 .7 .7 .8 .8 .9 1.0 1.1 1.0 .9 .9 .8 .6 .6 .6 .6 .7 .7 .6 .6 .7 .7 .8 .8 .7 .7 .7 .7 .8 .8 .9 .9 .7 .7
.9 1.0 .8 .7 .8 .8 .9 .9 .9 .9 .9 .9 .9 .9 .8 .8 .9 .8 .8 .7 .7 .7 .8 .8 .9 .9 .8 .8 .8 .9 .9 .9 .9 .8 .7 .8
1.0 1.1 1.1 1.0 .9 .9 .9 .8 .9 .9 .9 .9 .9 1.0 .9 .9 .9 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0 .9 .9 .9 .9 .8 .9 .9 .8 .8 .9
1.1 1.2 1.2 1.1 1.0 1.0 .9 .8 .8 .8 .8 .8 .9 1.1 1.1 1.1 1.0 1.1 1.1 1.1 1.2 1.2 1.1 1.1 1.1 1.0 .9 .8 .8 .8 .9 .9 1.0 .9 .9 1.0
1.0 1.1 1.0 .9 .9 .9 .9 .8 .8 .7 .7 .7 .7 .8 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.0 .9 .8 .7 .6 .6 .7 .8 .8 .9 .9 .9 .9
.8 .8 .8 .8 .8 .8 .7 .7 .6 .6 .5 .5 .5 .6 .7 .6 .6 .7 .7 .7 .8 .8 .8 .8 .7 .6 .6 .6 .6 .6 .7 .8 .8 .8 .7 .7
.6 .6 .7 .7 .7 .7 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .6 .6 .6 .6 .6
.7 .8 .8 .8 .9 .9 .9 .8 .8 .8 .7 .7 .7 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .7 .7 .7 .7

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

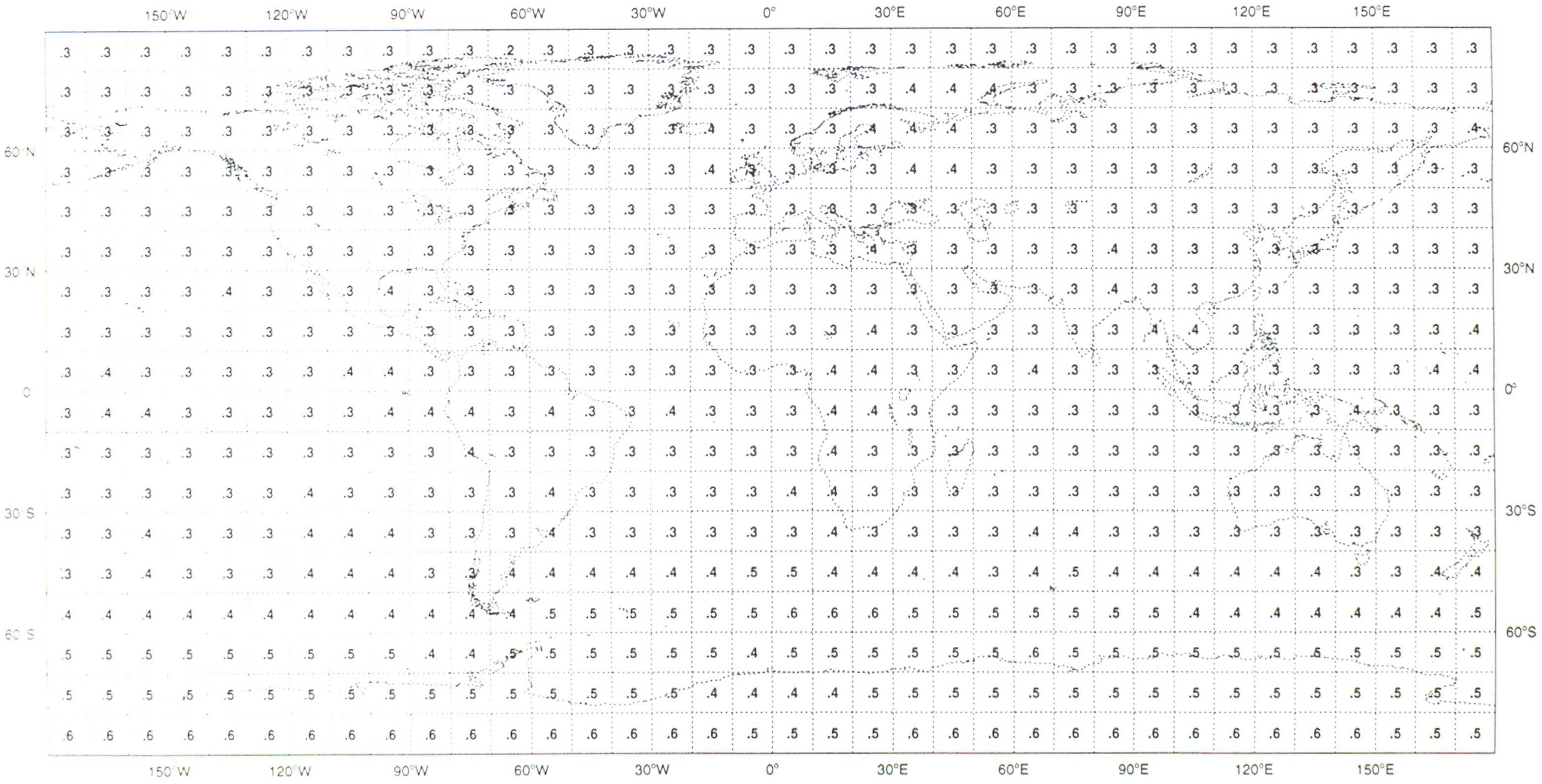
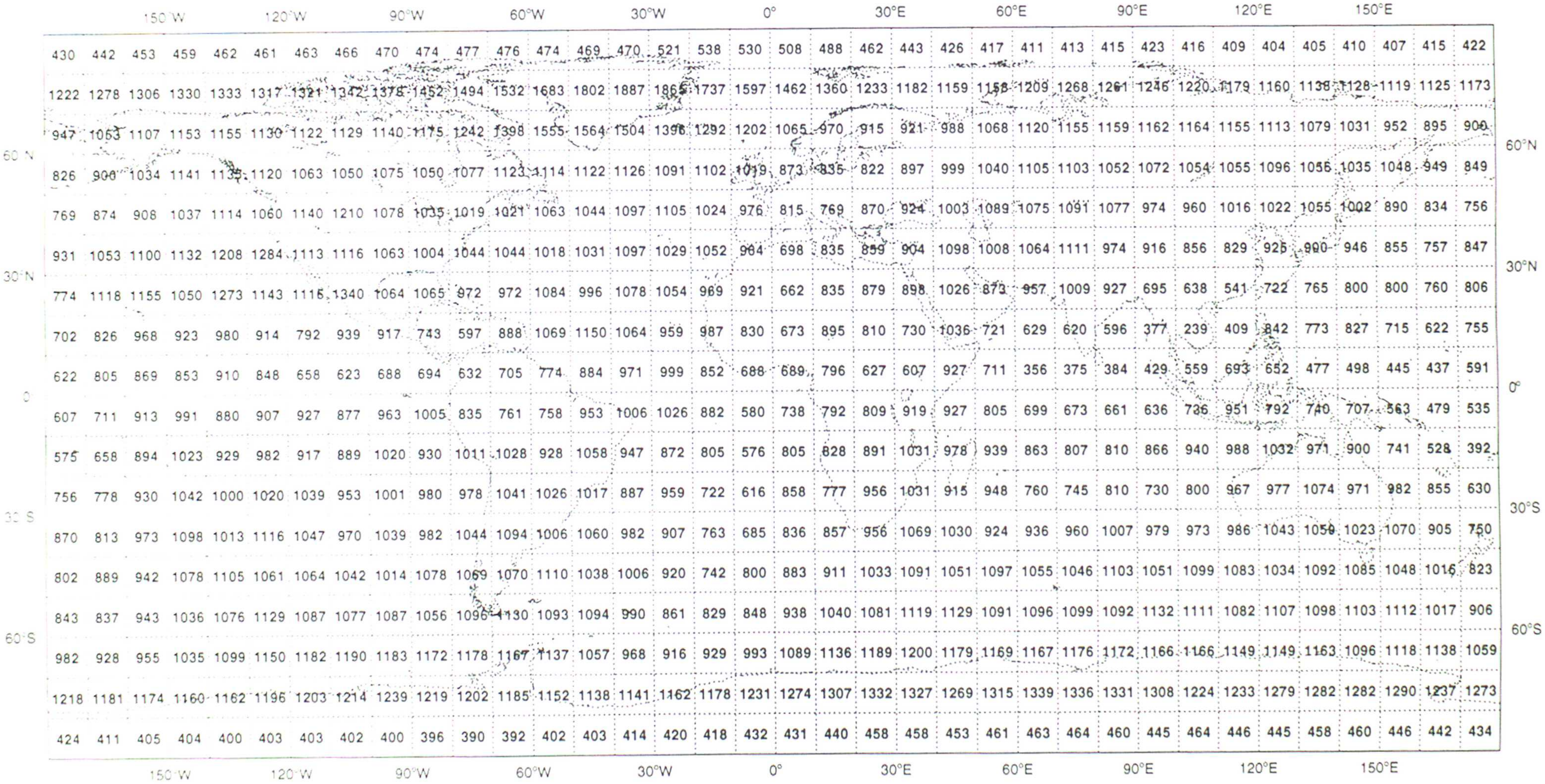

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 40. ATOVS mean daily count. MAY 2002

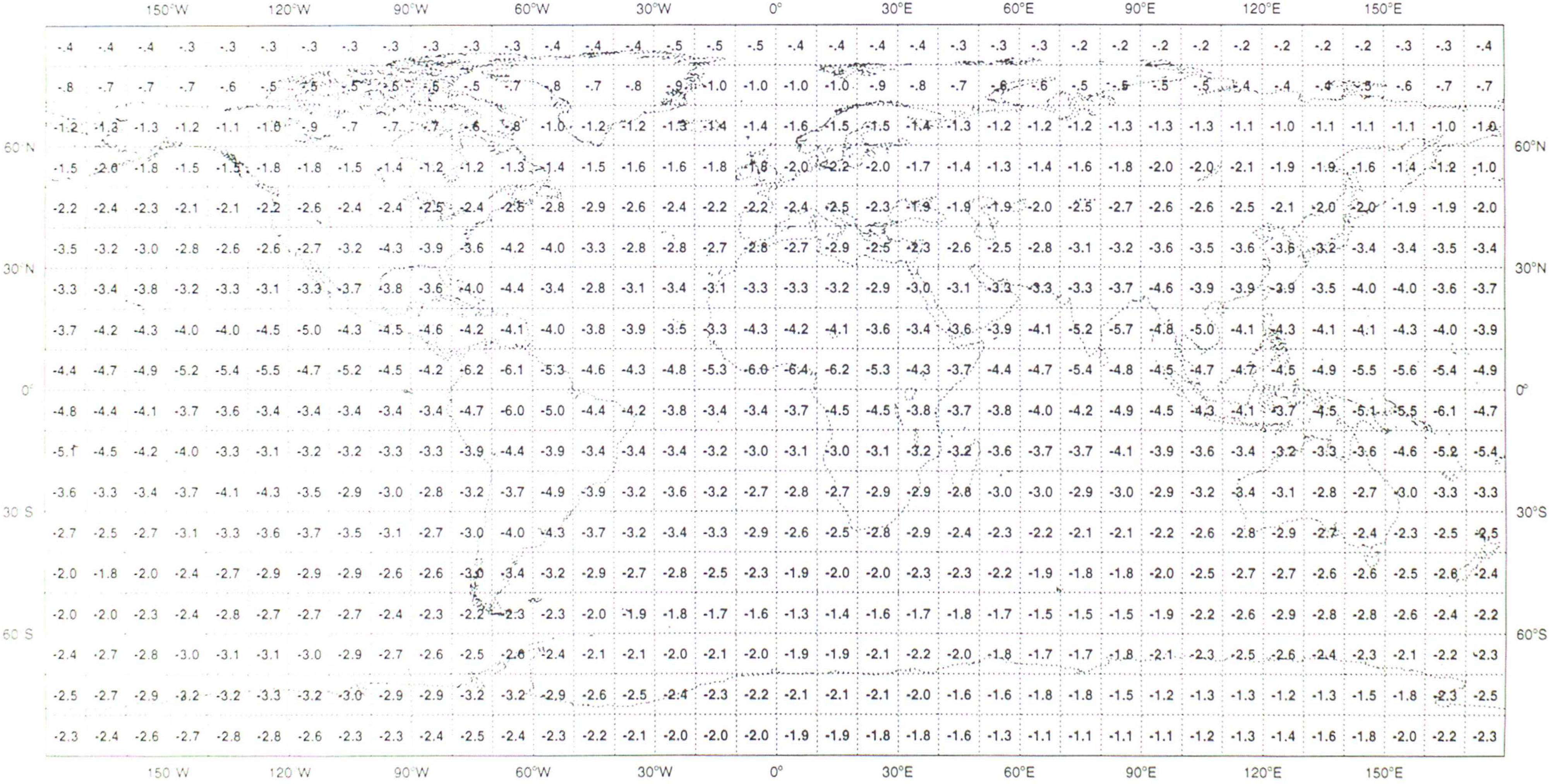
NOAA16, using all observations

Global average number of observations in 24 hours = 602402



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 430 | 442 | 453 | 459 | 462 | 461 | 463 | 466 | 470 | 474 | 477 | 476 | 474 | 469 | 470 | 521 | 538 | 530 | 508 | 488 | 462 | 443 | 426 | 417 | 411 | 413 | 415 | 423 | 416 | 409 | 404 | 405 | 410 | 407 | 415 | 422 |
| 1222 | 1278 | 1306 | 1330 | 1333 | 1317 | 1321 | 1342 | 1378 | 1452 | 1494 | 1532 | 1683 | 1802 | 1887 | 1865 | 1737 | 1597 | 1462 | 1360 | 1233 | 1182 | 1159 | 1158 | 1209 | 1268 | 1261 | 1246 | 1220 | 1179 | 1160 | 1138 | 1128 | 1119 | 1125 | 1173 |
| 947 | 1053 | 1107 | 1153 | 1155 | 1130 | 1122 | 1129 | 1140 | 1175 | 1242 | 1398 | 1555 | 1564 | 1504 | 1396 | 1292 | 1202 | 1065 | 970 | 915 | 921 | 988 | 1068 | 1120 | 1155 | 1159 | 1162 | 1164 | 1155 | 1113 | 1079 | 1031 | 952 | 895 | 900 |
| 826 | 900 | 1034 | 1141 | 1135 | 1120 | 1063 | 1050 | 1075 | 1050 | 1077 | 1123 | 1114 | 1122 | 1126 | 1091 | 1102 | 1019 | 873 | 835 | 822 | 897 | 999 | 1040 | 1105 | 1103 | 1052 | 1072 | 1054 | 1055 | 1096 | 1056 | 1035 | 1048 | 949 | 849 |
| 769 | 874 | 908 | 1037 | 1114 | 1060 | 1140 | 1210 | 1078 | 1035 | 1019 | 1021 | 1063 | 1044 | 1097 | 1105 | 1024 | 976 | 815 | 769 | 870 | 924 | 1003 | 1089 | 1075 | 1091 | 1077 | 974 | 960 | 1016 | 1022 | 1055 | 1002 | 890 | 834 | 756 |
| 931 | 1053 | 1100 | 1132 | 1208 | 1284 | 1113 | 1116 | 1063 | 1004 | 1044 | 1044 | 1018 | 1031 | 1097 | 1029 | 1052 | 904 | 698 | 835 | 859 | 904 | 1098 | 1008 | 1064 | 1111 | 974 | 916 | 856 | 829 | 925 | 990 | 946 | 855 | 757 | 847 |
| 774 | 1118 | 1155 | 1050 | 1273 | 1143 | 1115 | 1340 | 1064 | 1065 | 972 | 972 | 1084 | 996 | 1078 | 1054 | 969 | 921 | 662 | 835 | 879 | 898 | 1026 | 873 | 957 | 1009 | 927 | 695 | 638 | 541 | 722 | 765 | 800 | 800 | 760 | 806 |
| 702 | 826 | 968 | 923 | 980 | 914 | 792 | 939 | 917 | 743 | 597 | 888 | 1069 | 1150 | 1064 | 959 | 987 | 830 | 673 | 895 | 810 | 730 | 1036 | 721 | 629 | 620 | 596 | 377 | 239 | 409 | 842 | 773 | 827 | 715 | 622 | 755 |
| 622 | 805 | 869 | 853 | 910 | 848 | 658 | 623 | 688 | 694 | 632 | 705 | 774 | 884 | 971 | 999 | 852 | 688 | 689 | 796 | 627 | 607 | 927 | 711 | 356 | 375 | 384 | 429 | 559 | 693 | 652 | 477 | 498 | 445 | 437 | 591 |
| 607 | 711 | 913 | 991 | 880 | 907 | 927 | 877 | 963 | 1005 | 835 | 761 | 758 | 953 | 1006 | 1026 | 882 | 580 | 738 | 792 | 809 | 919 | 927 | 805 | 699 | 673 | 661 | 636 | 736 | 951 | 792 | 740 | 707 | 563 | 479 | 535 |
| 575 | 658 | 894 | 1023 | 929 | 982 | 917 | 889 | 1020 | 930 | 1011 | 1028 | 928 | 1058 | 947 | 872 | 805 | 576 | 805 | 828 | 891 | 1031 | 978 | 939 | 863 | 807 | 810 | 866 | 940 | 988 | 1032 | 971 | 900 | 741 | 528 | 392 |
| 756 | 778 | 930 | 1042 | 1000 | 1020 | 1039 | 953 | 1001 | 980 | 978 | 1041 | 1026 | 1017 | 887 | 959 | 722 | 616 | 858 | 777 | 956 | 1031 | 915 | 948 | 760 | 745 | 810 | 730 | 800 | 967 | 977 | 1074 | 971 | 982 | 855 | 630 |
| 870 | 813 | 973 | 1098 | 1013 | 1116 | 1047 | 970 | 1039 | 982 | 1044 | 1094 | 1006 | 1060 | 982 | 907 | 763 | 685 | 836 | 857 | 956 | 1069 | 1030 | 924 | 936 | 960 | 1007 | 979 | 973 | 986 | 1043 | 1059 | 1023 | 1070 | 905 | 750 |
| 802 | 889 | 942 | 1078 | 1105 | 1061 | 1064 | 1042 | 1014 | 1078 | 1069 | 1070 | 1110 | 1038 | 1006 | 920 | 742 | 800 | 883 | 911 | 1033 | 1091 | 1051 | 1097 | 1055 | 1046 | 1103 | 1051 | 1099 | 1083 | 1034 | 1092 | 1085 | 1048 | 1016 | 823 |
| 843 | 837 | 943 | 1036 | 1076 | 1129 | 1087 | 1077 | 1087 | 1056 | 1096 | 1130 | 1093 | 1094 | 990 | 861 | 829 | 848 | 938 | 1040 | 1081 | 1119 | 1129 | 1091 | 1096 | 1099 | 1092 | 1132 | 1111 | 1082 | 1107 | 1098 | 1103 | 1112 | 1017 | 906 |
| 982 | 928 | 955 | 1035 | 1099 | 1150 | 1182 | 1190 | 1183 | 1172 | 1178 | 1167 | 1137 | 1057 | 968 | 916 | 929 | 993 | 1089 | 1136 | 1189 | 1200 | 1179 | 1169 | 1167 | 1176 | 1172 | 1166 | 1166 | 1149 | 1149 | 1163 | 1096 | 1118 | 1138 | 1059 |
| 1218 | 1181 | 1174 | 1160 | 1162 | 1196 | 1203 | 1214 | 1239 | 1219 | 1202 | 1185 | 1152 | 1138 | 1141 | 1162 | 1178 | 1231 | 1274 | 1307 | 1332 | 1327 | 1269 | 1315 | 1339 | 1336 | 1331 | 1308 | 1224 | 1233 | 1279 | 1282 | 1282 | 1290 | 1237 | 1273 |
| 424 | 411 | 405 | 404 | 400 | 403 | 403 | 402 | 400 | 396 | 390 | 392 | 402 | 403 | 414 | 420 | 418 | 432 | 431 | 440 | 458 | 458 | 453 | 461 | 463 | 464 | 460 | 445 | 464 | 446 | 445 | 458 | 460 | 446 | 442 | 434 |

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

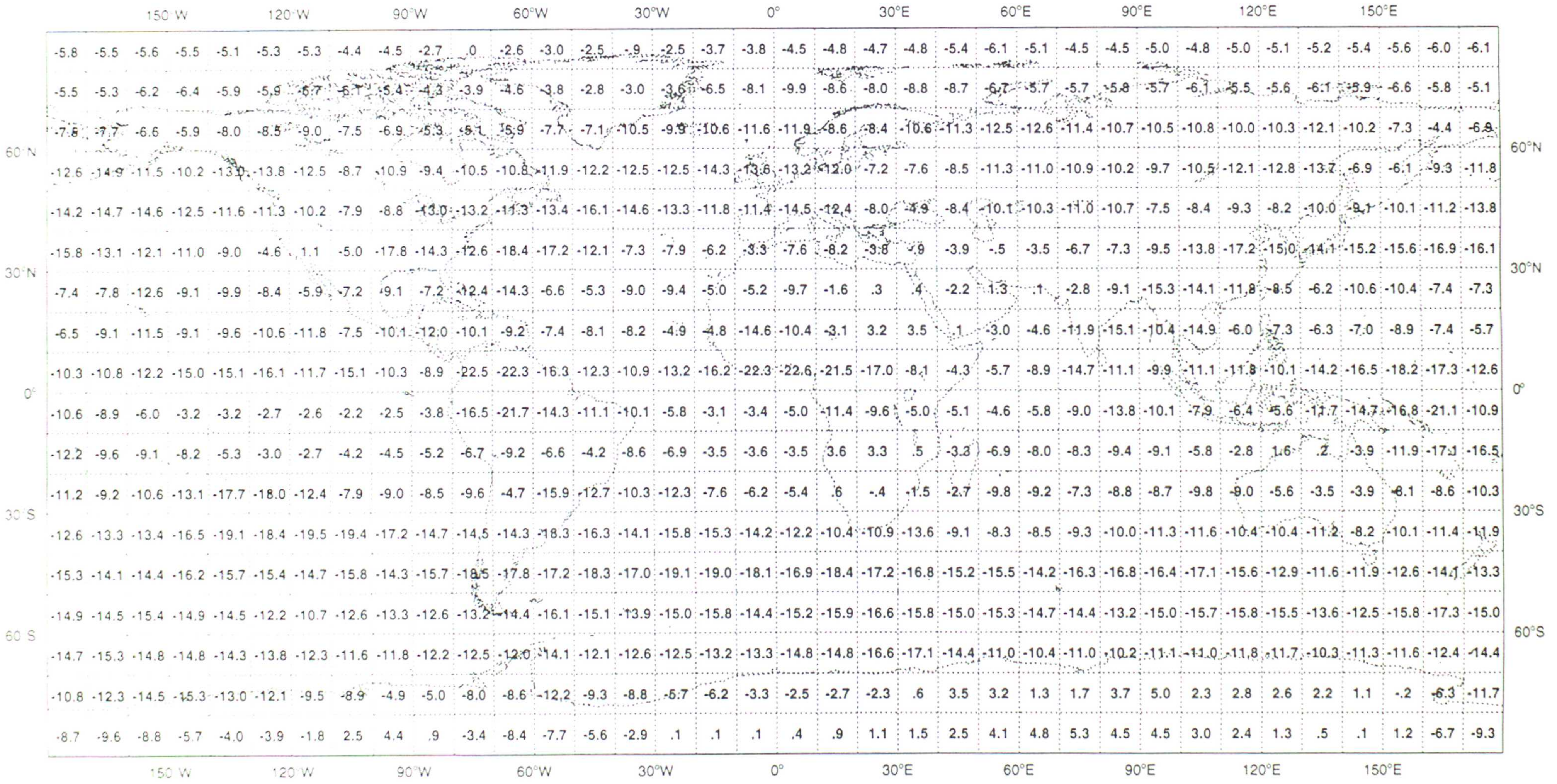


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -.4 | -.4 | -.4 | -.3 | -.3 | -.3 | -.3 | -.3 | -.3 | -.3 | -.3 | -.3 | -.4 | -.4 | -.4 | -.5 | -.5 | -.5 | -.4 | -.4 | -.4 | -.4 | -.3 | -.3 | -.3 | -.2 | -.2 | -.2 | -.2 | -.2 | -.2 | -.2 | -.2 | -.3 | -.3 | -.4 |
| -.8 | -.7 | -.7 | -.7 | -.6 | -.5 | -.5 | -.5 | -.5 | -.5 | -.5 | -.7 | -.8 | -.7 | -.8 | -.9 | -1.0 | -1.0 | -1.0 | -1.0 | -.9 | -.8 | -.7 | -.6 | -.6 | -.5 | -.5 | -.5 | -.5 | -.4 | -.4 | -.4 | -.5 | -.6 | -.7 | -.7 |
| -1.2 | -1.3 | -1.3 | -1.2 | -1.1 | -1.0 | -.9 | -.7 | -.7 | -.7 | -.6 | -.8 | -1.0 | -1.2 | -1.2 | -1.3 | -1.4 | -1.4 | -1.6 | -1.5 | -1.5 | -1.4 | -1.3 | -1.2 | -1.2 | -1.2 | -1.3 | -1.3 | -1.3 | -1.1 | -1.0 | -1.1 | -1.1 | -1.1 | -1.0 | -1.0 |
| -1.5 | -2.6 | -1.8 | -1.5 | -1.5 | -1.8 | -1.8 | -1.5 | -1.4 | -1.2 | -1.2 | -1.3 | -1.4 | -1.5 | -1.6 | -1.6 | -1.8 | -1.8 | -2.0 | -2.2 | -2.0 | -1.7 | -1.4 | -1.3 | -1.4 | -1.6 | -1.8 | -2.0 | -2.0 | -2.1 | -1.9 | -1.9 | -1.6 | -1.4 | -1.2 | -1.0 |
| -2.2 | -2.4 | -2.3 | -2.1 | -2.1 | -2.2 | -2.6 | -2.4 | -2.4 | -2.5 | -2.4 | -2.5 | -2.8 | -2.9 | -2.6 | -2.4 | -2.2 | -2.2 | -2.4 | -2.5 | -2.3 | -1.9 | -1.9 | -1.9 | -2.0 | -2.5 | -2.7 | -2.6 | -2.6 | -2.5 | -2.1 | -2.0 | -2.0 | -1.9 | -1.9 | -2.0 |
| -3.5 | -3.2 | -3.0 | -2.8 | -2.6 | -2.6 | -2.7 | -3.2 | -4.3 | -3.9 | -3.6 | -4.2 | -4.0 | -3.3 | -2.8 | -2.8 | -2.7 | -2.8 | -2.7 | -2.9 | -2.5 | -2.3 | -2.6 | -2.5 | -2.8 | -3.1 | -3.2 | -3.6 | -3.5 | -3.6 | -3.6 | -3.2 | -3.4 | -3.4 | -3.5 | -3.4 |
| -3.3 | -3.4 | -3.8 | -3.2 | -3.3 | -3.1 | -3.3 | -3.7 | -3.8 | -3.6 | -4.0 | -4.4 | -3.4 | -2.8 | -3.1 | -3.4 | -3.1 | -3.3 | -3.3 | -3.2 | -2.9 | -3.0 | -3.1 | -3.3 | -3.3 | -3.3 | -3.7 | -4.6 | -3.9 | -3.9 | -3.9 | -3.5 | -4.0 | -4.0 | -3.6 | -3.7 |
| -3.7 | -4.2 | -4.3 | -4.0 | -4.0 | -4.5 | -5.0 | -4.3 | -4.5 | -4.6 | -4.2 | -4.1 | -4.0 | -3.8 | -3.9 | -3.5 | -3.3 | -4.3 | -4.2 | -4.1 | -3.6 | -3.4 | -3.6 | -3.9 | -4.1 | -5.2 | -5.7 | -4.8 | -5.0 | -4.1 | -4.3 | -4.1 | -4.1 | -4.3 | -4.0 | -3.9 |
| -4.4 | -4.7 | -4.9 | -5.2 | -5.4 | -5.5 | -4.7 | -5.2 | -4.5 | -4.2 | -6.2 | -6.1 | -5.3 | -4.6 | -4.3 | -4.8 | -5.3 | -6.0 | -6.4 | -6.2 | -5.3 | -4.3 | -3.7 | -4.4 | -4.7 | -5.4 | -4.8 | -4.5 | -4.7 | -4.7 | -4.5 | -4.9 | -5.5 | -5.6 | -5.4 | -4.9 |
| -4.8 | -4.4 | -4.1 | -3.7 | -3.6 | -3.4 | -3.4 | -3.4 | -3.4 | -3.4 | -4.7 | -6.0 | -5.0 | -4.4 | -4.2 | -3.8 | -3.4 | -3.4 | -3.7 | -4.5 | -4.5 | -3.8 | -3.7 | -3.8 | -4.0 | -4.2 | -4.9 | -4.5 | -4.3 | -4.1 | -3.7 | -4.5 | -5.1 | -5.5 | -6.1 | -4.7 |
| -5.1 | -4.5 | -4.2 | -4.0 | -3.3 | -3.1 | -3.2 | -3.2 | -3.3 | -3.3 | -3.9 | -4.4 | -3.9 | -3.4 | -3.4 | -3.4 | -3.2 | -3.0 | -3.1 | -3.0 | -3.1 | -3.2 | -3.2 | -3.6 | -3.7 | -3.7 | -4.1 | -3.9 | -3.6 | -3.4 | -3.2 | -3.3 | -3.6 | -4.6 | -5.2 | -5.4 |
| -3.6 | -3.3 | -3.4 | -3.7 | -4.1 | -4.3 | -3.5 | -2.9 | -3.0 | -2.8 | -3.2 | -3.7 | -4.9 | -3.9 | -3.2 | -3.6 | -3.2 | -2.7 | -2.8 | -2.7 | -2.9 | -2.9 | -2.8 | -3.0 | -3.0 | -2.9 | -3.0 | -2.9 | -3.2 | -3.4 | -3.1 | -2.8 | -2.7 | -3.0 | -3.3 | -3.3 |
| -2.7 | -2.5 | -2.7 | -3.1 | -3.3 | -3.6 | -3.7 | -3.5 | -3.1 | -2.7 | -3.0 | -4.0 | -4.3 | -3.7 | -3.2 | -3.4 | -3.3 | -2.9 | -2.6 | -2.5 | -2.8 | -2.9 | -2.4 | -2.3 | -2.2 | -2.1 | -2.1 | -2.2 | -2.6 | -2.8 | -2.9 | -2.7 | -2.4 | -2.3 | -2.5 | -2.5 |
| -2.0 | -1.8 | -2.0 | -2.4 | -2.7 | -2.9 | -2.9 | -2.9 | -2.6 | -2.6 | -3.0 | -3.4 | -3.2 | -2.9 | -2.7 | -2.8 | -2.5 | -2.3 | -1.9 | -2.0 | -2.0 | -2.3 | -2.3 | -2.2 | -1.9 | -1.8 | -1.8 | -2.0 | -2.5 | -2.7 | -2.7 | -2.6 | -2.6 | -2.5 | -2.6 | -2.4 |
| -2.0 | -2.0 | -2.3 | -2.4 | -2.8 | -2.7 | -2.7 | -2.7 | -2.4 | -2.3 | -2.2 | -2.3 | -2.3 | -2.0 | -1.9 | -1.8 | -1.7 | -1.6 | -1.3 | -1.4 | -1.6 | -1.7 | -1.8 | -1.7 | -1.5 | -1.5 | -1.5 | -1.9 | -2.2 | -2.6 | -2.9 | -2.8 | -2.8 | -2.6 | -2.4 | -2.2 |
| -2.4 | -2.7 | -2.8 | -3.0 | -3.1 | -3.1 | -3.0 | -2.9 | -2.7 | -2.6 | -2.5 | -2.6 | -2.4 | -2.1 | -2.1 | -2.0 | -2.1 | -2.0 | -1.9 | -1.9 | -2.1 | -2.2 | -2.0 | -1.8 | -1.7 | -1.7 | -1.8 | -2.1 | -2.3 | -2.5 | -2.6 | -2.4 | -2.3 | -2.1 | -2.2 | -2.3 |
| -2.5 | -2.7 | -2.9 | -3.2 | -3.2 | -3.3 | -3.2 | -3.0 | -2.9 | -2.9 | -3.2 | -3.2 | -2.9 | -2.6 | -2.5 | -2.4 | -2.3 | -2.2 | -2.1 | -2.1 | -2.1 | -2.0 | -1.6 | -1.6 | -1.8 | -1.8 | -1.5 | -1.2 | -1.3 | -1.3 | -1.2 | -1.3 | -1.5 | -1.8 | -2.3 | -2.5 |
| -2.3 | -2.4 | -2.6 | -2.7 | -2.8 | -2.8 | -2.6 | -2.3 | -2.3 | -2.4 | -2.5 | -2.4 | -2.3 | -2.2 | -2.1 | -2.0 | -2.0 | -2.0 | -1.9 | -1.9 | -1.8 | -1.8 | -1.6 | -1.3 | -1.1 | -1.1 | -1.1 | -1.1 | -1.2 | -1.3 | -1.4 | -1.6 | -1.8 | -2.0 | -2.2 | -2.3 |

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002

Channel: HIRS8 (Surface)

NOAA16, using all observations



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -5.8 | -5.5 | -5.6 | -5.5 | -5.1 | -5.3 | -5.3 | -4.4 | -4.5 | -2.7 | .0 | -2.6 | -3.0 | -2.5 | -.9 | -2.5 | -3.7 | -3.8 | -4.5 | -4.8 | -4.7 | -4.8 | -5.4 | -6.1 | -5.1 | -4.5 | -4.5 | -5.0 | -4.8 | -5.0 | -5.1 | -5.2 | -5.4 | -5.6 | -6.0 | -6.1 |
| -5.5 | -5.3 | -6.2 | -6.4 | -5.9 | -5.9 | -6.7 | -6.1 | -5.4 | -4.3 | -3.9 | -4.6 | -3.8 | -2.8 | -3.0 | -3.6 | -6.5 | -8.1 | -9.9 | -8.6 | -8.0 | -8.8 | -8.7 | -6.7 | -5.7 | -5.7 | -5.8 | -5.7 | -6.1 | -5.5 | -5.6 | -6.1 | -5.9 | -6.6 | -5.8 | -5.1 |
| -7.8 | -7.7 | -6.6 | -5.9 | -8.0 | -8.5 | -9.0 | -7.5 | -6.9 | -5.3 | -5.1 | -5.9 | -7.7 | -7.1 | -10.5 | -9.9 | -10.6 | -11.6 | -11.9 | -8.6 | -8.4 | -10.6 | -11.3 | -12.5 | -12.6 | -11.4 | -10.7 | -10.5 | -10.8 | -10.0 | -10.3 | -12.1 | -10.2 | -7.3 | -4.4 | -6.8 |
| -12.6 | -14.9 | -11.5 | -10.2 | -13.0 | -13.8 | -12.5 | -8.7 | -10.9 | -9.4 | -10.5 | -10.8 | -11.9 | -12.2 | -12.5 | -12.5 | -14.3 | -13.6 | -13.2 | -12.0 | -7.2 | -7.6 | -8.5 | -11.3 | -11.0 | -10.9 | -10.2 | -9.7 | -10.5 | -12.1 | -12.8 | -13.7 | -6.9 | -6.1 | -9.3 | -11.8 |
| -14.2 | -14.7 | -14.6 | -12.5 | -11.6 | -11.3 | -10.2 | -7.9 | -8.8 | -13.0 | -13.2 | -11.3 | -13.4 | -16.1 | -14.6 | -13.3 | -11.8 | -11.4 | -14.5 | -12.4 | -8.0 | -4.9 | -8.4 | -10.1 | -10.3 | -11.0 | -10.7 | -7.5 | -8.4 | -9.3 | -8.2 | -10.0 | -9.1 | -10.1 | -11.2 | -13.8 |
| -15.8 | -13.1 | -12.1 | -11.0 | -9.0 | -4.6 | 1.1 | -5.0 | -17.8 | -14.3 | -12.6 | -18.4 | -17.2 | -12.1 | -7.3 | -7.9 | -6.2 | -3.3 | -7.6 | -8.2 | -3.8 | -.9 | -3.9 | -.5 | -3.5 | -6.7 | -7.3 | -9.5 | -13.8 | -17.2 | -15.0 | -14.1 | -15.2 | -15.6 | -16.9 | -16.1 |
| -7.4 | -7.8 | -12.6 | -9.1 | -9.9 | -8.4 | -5.9 | -7.2 | -9.1 | -7.2 | -12.4 | -14.3 | -6.6 | -5.3 | -9.0 | -9.4 | -5.0 | -5.2 | -9.7 | -1.6 | .3 | .4 | -2.2 | 1.3 | .1 | -2.8 | -9.1 | -15.3 | -14.1 | -11.8 | -8.5 | -6.2 | -10.6 | -10.4 | -7.4 | -7.3 |
| -6.5 | -9.1 | -11.5 | -9.1 | -9.6 | -10.6 | -11.8 | -7.5 | -10.1 | -12.0 | -10.1 | -9.2 | -7.4 | -8.1 | -8.2 | -4.9 | -4.8 | -14.6 | -10.4 | -3.1 | 3.2 | 3.5 | .1 | -3.0 | -4.6 | -11.9 | -15.1 | -10.4 | -14.9 | -6.0 | -7.3 | -6.3 | -7.0 | -8.9 | -7.4 | -5.7 |
| -10.3 | -10.8 | -12.2 | -15.0 | -15.1 | -16.1 | -11.7 | -15.1 | -10.3 | -8.9 | -22.5 | -22.3 | -16.3 | -12.3 | -10.9 | -13.2 | -16.2 | -22.3 | -22.6 | -21.5 | -17.0 | -8.1 | -4.3 | -5.7 | -8.9 | -14.7 | -11.1 | -9.9 | -11.1 | -11.8 | -10.1 | -14.2 | -16.5 | -18.2 | -17.3 | -12.6 |
| -10.6 | -8.9 | -6.0 | -3.2 | -3.2 | -2.7 | -2.6 | -2.2 | -2.5 | -3.8 | -16.5 | -21.7 | -14.3 | -11.1 | -10.1 | -5.8 | -3.1 | -3.4 | -5.0 | -11.4 | -9.6 | -5.0 | -5.1 | -4.6 | -5.8 | -9.0 | -13.8 | -10.1 | -7.9 | -6.4 | -5.6 | -11.7 | -14.7 | -16.8 | -21.1 | -10.9 |
| -12.2 | -9.6 | -9.1 | -8.2 | -5.3 | -3.0 | -2.7 | -4.2 | -4.5 | -5.2 | -6.7 | -9.2 | -6.6 | -4.2 | -8.6 | -6.9 | -3.5 | -3.6 | -3.5 | 3.6 | 3.3 | .5 | -3.3 | -6.9 | -8.0 | -8.3 | -9.4 | -9.1 | -5.8 | -2.8 | 1.6 | .2 | -3.9 | -11.9 | -17.1 | -16.5 |
| -11.2 | -9.2 | -10.6 | -13.1 | -17.7 | -18.0 | -12.4 | -7.9 | -9.0 | -8.5 | -9.6 | -4.7 | -15.9 | -12.7 | -10.3 | -12.3 | -7.6 | -6.2 | -5.4 | .6 | -.4 | -1.5 | -2.7 | -9.8 | -9.2 | -7.3 | -8.8 | -8.7 | -9.8 | -9.0 | -5.6 | -3.5 | -3.9 | -8.1 | -8.6 | -10.3 |
| -12.6 | -13.3 | -13.4 | -16.5 | -19.1 | -18.4 | -19.5 | -19.4 | -17.2 | -14.7 | -14.5 | -14.3 | -18.3 | -16.3 | -14.1 | -15.8 | -15.3 | -14.2 | -12.2 | -10.4 | -10.9 | -13.6 | -9.1 | -8.3 | -8.5 | -9.3 | -10.0 | -11.3 | -11.6 | -10.4 | -10.4 | -11.2 | -8.2 | -10.1 | -11.4 | -11.9 |
| -15.3 | -14.1 | -14.4 | -16.2 | -15.7 | -15.4 | -14.7 | -15.8 | -14.3 | -15.7 | -18.5 | -17.8 | -17.2 | -18.3 | -17.0 | -19.1 | -19.0 | -18.1 | -16.9 | -18.4 | -17.2 | -16.8 | -15.2 | -15.5 | -14.2 | -16.3 | -16.8 | -16.4 | -17.1 | -15.6 | -12.9 | -11.6 | -11.9 | -12.6 | -14.1 | -13.3 |
| -14.9 | -14.5 | -15.4 | -14.9 | -14.5 | -12.2 | -10.7 | -12.6 | -13.3 | -12.6 | -13.2 | -14.4 | -16.1 | -15.1 | -13.9 | -15.0 | -15.8 | -14.4 | -15.2 | -15.9 | -16.6 | -15.8 | -15.0 | -15.3 | -14.7 | -14.4 | -13.2 | -15.0 | -15.7 | -15.8 | -15.5 | -13.6 | -12.5 | -15.8 | -17.3 | -15.0 |
| -14.7 | -15.3 | -14.8 | -14.8 | -14.3 | -13.8 | -12.3 | -11.6 | -11.8 | -12.2 | -12.5 | -12.0 | -14.1 | -12.1 | -12.6 | -12.5 | -13.2 | -13.3 | -14.8 | -14.8 | -16.6 | -17.1 | -14.4 | -11.0 | -10.4 | -11.0 | -10.2 | -11.1 | -11.0 | -11.8 | -11.7 | -10.3 | -11.3 | -11.6 | -12.4 | -14.4 |
| -10.8 | -12.3 | -14.5 | -15.3 | -13.0 | -12.1 | -9.5 | -8.9 | -4.9 | -5.0 | -8.0 | -8.6 | -12.2 | -9.3 | -8.8 | -6.7 | -6.2 | -3.3 | -2.5 | -2.7 | -2.3 | .6 | 3.5 | 3.2 | 1.3 | 1.7 | 3.7 | 5.0 | 2.3 | 2.8 | 2.6 | 2.2 | 1.1 | -.2 | -6.3 | -11.7 |
| -8.7 | -9.6 | -8.8 | -5.7 | -4.0 | -3.9 | -1.8 | 2.5 | 4.4 | .9 | -3.4 | -8.4 | -7.7 | -5.6 | -2.9 | .1 | .1 | .1 | .4 | .9 | 1.1 | 1.5 | 2.5 | 4.1 | 4.8 | 5.3 | 4.5 | 4.5 | 3.0 | 2.4 | 1.3 | .5 | .1 | 1.2 | -6.7 | -9.3 |

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

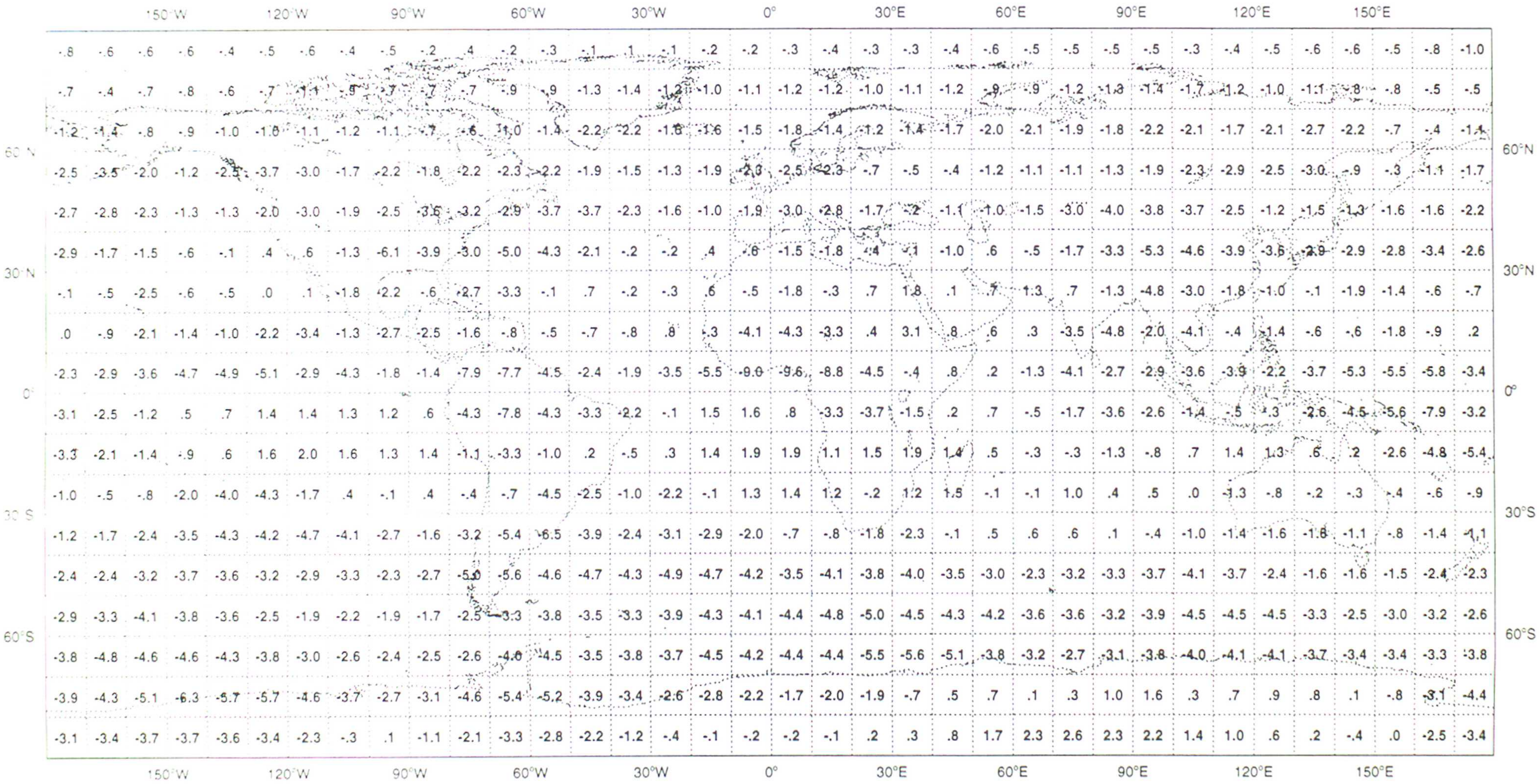
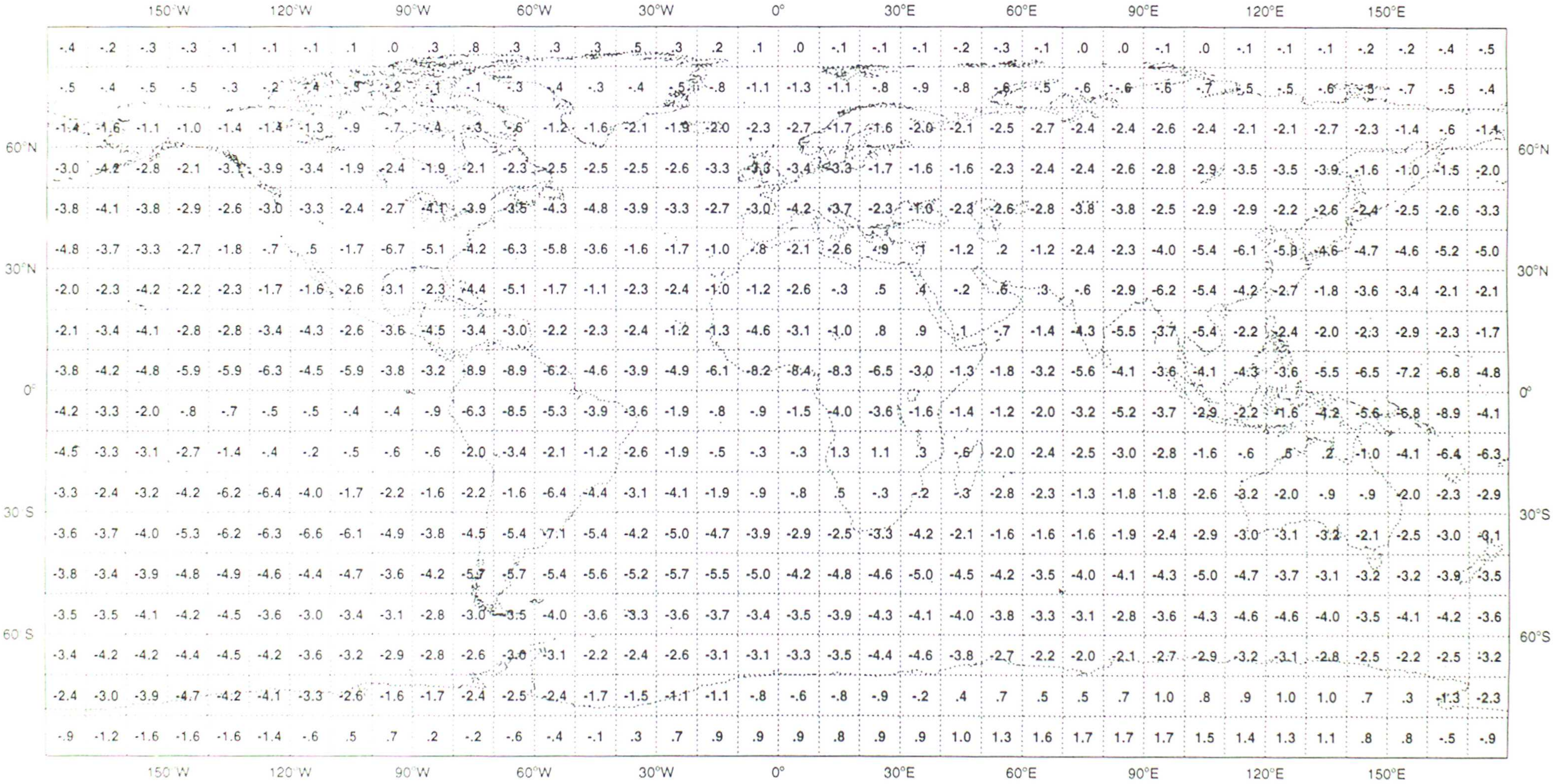

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.8 -.6 -.6 -.6 -.4 -.5 -.6 -.4 -.5 -.2 .4 -.2 -.3 -.1 .1 -.1 -.2 -.2 -.3 -.4 -.3 -.3 -.4 -.6 -.5 -.5 -.5 -.5 -.3 -.4 -.5 -.6 -.6 -.5 -.8 -1.0
-.7 -.4 -.7 -.8 -.6 -.7 -1.1 -.9 -.7 -.7 -.7 -.9 -.9 -1.3 -1.4 -1.2 -1.0 -1.1 -1.2 -1.2 -1.0 -1.1 -1.2 -.9 -.9 -1.2 -1.3 -1.4 -1.7 -1.2 -1.0 -1.1 -.8 -.8 -.5 -.5
-1.2 -1.4 -.8 -.9 -1.0 -1.0 -1.1 -1.2 -1.1 -.7 -.6 -1.0 -1.4 -2.2 -2.2 -1.8 -1.6 -1.5 -1.8 -1.4 -1.2 -1.4 -1.7 -2.0 -2.1 -1.9 -1.8 -2.2 -2.1 -1.7 -2.1 -2.7 -2.2 -.7 -.4 -1.4
-2.5 -3.5 -2.0 -1.2 -2.5 -3.7 -3.0 -1.7 -2.2 -1.8 -2.2 -2.3 -2.2 -1.9 -1.5 -1.3 -1.9 -2.3 -2.5 -2.3 -.7 -.5 -.4 -1.2 -1.1 -1.1 -1.3 -1.9 -2.3 -2.9 -2.5 -3.0 -.9 -.3 -1.1 -1.7
-2.7 -2.8 -2.3 -1.3 -1.3 -2.0 -3.0 -1.9 -2.5 -3.5 -3.2 -2.9 -3.7 -3.7 -2.3 -1.6 -1.0 -1.9 -3.0 -2.8 -1.7 -.2 -1.1 -1.0 -1.5 -3.0 -4.0 -3.8 -3.7 -2.5 -1.2 -1.5 -1.3 -1.6 -1.6 -2.2
-2.9 -1.7 -1.5 -.6 -.1 .4 .6 -1.3 -6.1 -3.9 -3.0 -5.0 -4.3 -2.1 -.2 -.2 .4 -.6 -1.5 -1.8 .4 -.1 -1.0 .6 -.5 -1.7 -3.3 -5.3 -4.6 -3.9 -3.5 -2.9 -2.9 -2.8 -3.4 -2.6
-.1 -.5 -2.5 -.6 -.5 .0 .1 -1.8 -2.2 -.6 -2.7 -3.3 -.1 .7 -.2 -.3 .6 -.5 -1.8 -.3 .7 1.8 .1 .7 1.3 .7 -1.3 -4.8 -3.0 -1.8 -1.0 -.1 -1.9 -1.4 -.6 -.7
.0 -.9 -2.1 -1.4 -1.0 -2.2 -3.4 -1.3 -2.7 -2.5 -1.6 -.8 -.5 -.7 -.8 .8 -.3 -4.1 -4.3 -3.3 .4 3.1 .8 .6 .3 -3.5 -4.8 -2.0 -4.1 -.4 -1.4 -.6 -.6 -1.8 -.9 .2
-2.3 -2.9 -3.6 -4.7 -4.9 -5.1 -2.9 -4.3 -1.8 -1.4 -7.9 -7.7 -4.5 -2.4 -1.9 -3.5 -5.5 -9.0 -9.6 -8.8 -4.5 -.4 .8 .2 -1.3 -4.1 -2.7 -2.9 -3.6 -3.9 -2.2 -3.7 -5.3 -5.5 -5.8 -3.4
-3.1 -2.5 -1.2 .5 .7 1.4 1.4 1.3 1.2 .6 -4.3 -7.8 -4.3 -3.3 -2.2 -.1 1.5 1.6 .8 -3.3 -3.7 -1.5 .2 .7 -.5 -1.7 -3.6 -2.6 -1.4 -.5 .3 -2.6 -4.5 -5.6 -7.9 -3.2
-3.3 -2.1 -1.4 -.9 .6 1.6 2.0 1.6 1.3 1.4 -1.1 -3.3 -1.0 .2 -.5 .3 1.4 1.9 1.9 1.1 1.5 1.9 1.4 .5 -.3 -.3 -1.3 -.8 .7 1.4 1.3 .6 .2 -2.6 -4.8 -5.4
-1.0 -.5 -.8 -2.0 -4.0 -4.3 -1.7 .4 -.1 .4 -.4 -.7 -4.5 -2.5 -1.0 -2.2 -.1 1.3 1.4 1.2 -.2 1.2 1.5 -.1 -.1 1.0 .4 .5 .0 -1.3 -.8 -.2 -.3 -.4 -.6 -.9
-1.2 -1.7 -2.4 -3.5 -4.3 -4.2 -4.7 -4.1 -2.7 -1.6 -3.2 -5.4 -6.5 -3.9 -2.4 -3.1 -2.9 -2.0 -.7 -.8 -1.8 -2.3 -.1 .5 .6 .6 .1 -.4 -1.0 -1.4 -1.6 -1.8 -1.1 -.8 -1.4 -1.1
-2.4 -2.4 -3.2 -3.7 -3.6 -3.2 -2.9 -3.3 -2.3 -2.7 -5.0 -5.6 -4.6 -4.7 -4.3 -4.9 -4.7 -4.2 -3.5 -4.1 -3.8 -4.0 -3.5 -3.0 -2.3 -3.2 -3.3 -3.7 -4.1 -3.7 -2.4 -1.6 -1.6 -1.5 -2.4 -2.3
-2.9 -3.3 -4.1 -3.8 -3.6 -2.5 -1.9 -2.2 -1.9 -1.7 -2.5 -3.3 -3.8 -3.5 -3.3 -3.9 -4.3 -4.1 -4.4 -4.8 -5.0 -4.5 -4.3 -4.2 -3.6 -3.6 -3.2 -3.9 -4.5 -4.5 -4.5 -3.3 -2.5 -3.0 -3.2 -2.6
-3.8 -4.8 -4.6 -4.6 -4.3 -3.8 -3.0 -2.6 -2.4 -2.5 -2.6 -4.0 -4.5 -3.5 -3.8 -3.7 -4.5 -4.2 -4.4 -4.4 -5.5 -5.6 -5.1 -3.8 -3.2 -2.7 -3.1 -3.8 -4.0 -4.1 -4.1 -3.7 -3.4 -3.4 -3.3 -3.8
-3.9 -4.3 -5.1 -6.3 -5.7 -5.7 -4.6 -3.7 -2.7 -3.1 -4.6 -5.4 -5.2 -3.9 -3.4 -2.6 -2.8 -2.2 -1.7 -2.0 -1.9 -.7 .5 .7 .1 .3 1.0 1.6 .3 .7 .9 .8 .1 -.8 -3.1 -4.4
-3.1 -3.4 -3.7 -3.7 -3.6 -3.4 -2.3 -.3 .1 -1.1 -2.1 -3.3 -2.8 -2.2 -1.2 -.4 -.1 -.2 -.2 -.1 .2 .3 .8 1.7 2.3 2.6 2.3 2.2 1.4 1.0 .6 .2 -.4 .0 -2.5 -3.4

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -.4 | -.2 | -.3 | -.3 | -.1 | -.1 | -.1 | .1 | .0 | .3 | .8 | .3 | .3 | .3 | .5 | .3 | .2 | .1 | .0 | -.1 | -.1 | -.1 | -.2 | -.3 | -.1 | .0 | .0 | -.1 | .0 | -.1 | -.1 | -.1 | -.2 | -.2 | -.4 | -.5 |
| -.5 | -.4 | -.5 | -.5 | -.3 | -.2 | -.4 | -.5 | -.2 | -.1 | -.1 | -.3 | -.4 | -.3 | -.4 | -.5 | -.8 | -1.1 | -1.3 | -1.1 | -.8 | -.9 | -.8 | -.6 | -.5 | -.6 | -.6 | -.6 | -.7 | -.5 | -.5 | -.6 | -.3 | -.7 | -.5 | -.4 |
| -1.4 | -1.6 | -1.1 | -1.0 | -1.4 | -1.4 | -1.3 | -.9 | -.7 | -.4 | -.3 | -.6 | -1.2 | -1.6 | -2.1 | -1.9 | -2.0 | -2.3 | -2.7 | -1.7 | -1.6 | -2.0 | -2.1 | -2.5 | -2.7 | -2.4 | -2.4 | -2.6 | -2.4 | -2.1 | -2.1 | -2.7 | -2.3 | -1.4 | -.6 | -1.4 |
| -3.0 | -4.2 | -2.8 | -2.1 | -3.1 | -3.9 | -3.4 | -1.9 | -2.4 | -1.9 | -2.1 | -2.3 | -2.5 | -2.5 | -2.5 | -2.6 | -3.3 | -3.3 | -3.4 | -3.3 | -1.7 | -1.6 | -1.6 | -2.3 | -2.4 | -2.4 | -2.6 | -2.8 | -2.9 | -3.5 | -3.5 | -3.9 | -1.6 | -1.0 | -1.5 | -2.0 |
| -3.8 | -4.1 | -3.8 | -2.9 | -2.6 | -3.0 | -3.3 | -2.4 | -2.7 | -4.1 | -3.9 | -3.5 | -4.3 | -4.8 | -3.9 | -3.3 | -2.7 | -3.0 | -4.2 | -3.7 | -2.3 | -1.0 | -2.3 | -2.6 | -2.8 | -3.8 | -3.8 | -2.5 | -2.9 | -2.9 | -2.2 | -2.6 | -2.4 | -2.5 | -2.6 | -3.3 |
| -4.8 | -3.7 | -3.3 | -2.7 | -1.8 | -.7 | .5 | -1.7 | -6.7 | -5.1 | -4.2 | -6.3 | -5.8 | -3.6 | -1.6 | -1.7 | -1.0 | -.8 | -2.1 | -2.6 | -.9 | .1 | -1.2 | .2 | -1.2 | -2.4 | -2.3 | -4.0 | -5.4 | -6.1 | -5.8 | -4.6 | -4.7 | -4.6 | -5.2 | -5.0 |
| -2.0 | -2.3 | -4.2 | -2.2 | -2.3 | -1.7 | -1.6 | -2.6 | -3.1 | -2.3 | -4.4 | -5.1 | -1.7 | -1.1 | -2.3 | -2.4 | -1.0 | -1.2 | -2.6 | -.3 | .5 | .4 | -.2 | .6 | .3 | -.6 | -2.9 | -6.2 | -5.4 | -4.2 | -2.7 | -1.8 | -3.6 | -3.4 | -2.1 | -2.1 |
| -2.1 | -3.4 | -4.1 | -2.8 | -2.8 | -3.4 | -4.3 | -2.6 | -3.6 | -4.5 | -3.4 | -3.0 | -2.2 | -2.3 | -2.4 | -1.2 | -1.3 | -4.6 | -3.1 | -1.0 | .8 | .9 | .1 | -.7 | -1.4 | -4.3 | -5.5 | -3.7 | -5.4 | -2.2 | -2.4 | -2.0 | -2.3 | -2.9 | -2.3 | -1.7 |
| -3.8 | -4.2 | -4.8 | -5.9 | -5.9 | -6.3 | -4.5 | -5.9 | -3.8 | -3.2 | -8.9 | -8.9 | -6.2 | -4.6 | -3.9 | -4.9 | -6.1 | -8.2 | -8.4 | -8.3 | -6.5 | -3.0 | -1.3 | -1.8 | -3.2 | -5.6 | -4.1 | -3.6 | -4.1 | -4.3 | -3.6 | -5.5 | -6.5 | -7.2 | -6.8 | -4.8 |
| -4.2 | -3.3 | -2.0 | -.8 | -.7 | -.5 | -.5 | -.4 | -.4 | -.9 | -6.3 | -8.5 | -5.3 | -3.9 | -3.6 | -1.9 | -.8 | -.9 | -1.5 | -4.0 | -3.6 | -1.6 | -1.4 | -1.2 | -2.0 | -3.2 | -5.2 | -3.7 | -2.9 | -2.2 | -1.6 | -4.2 | -5.6 | -6.8 | -8.9 | -4.1 |
| -4.5 | -3.3 | -3.1 | -2.7 | -1.4 | -.4 | -.2 | -.5 | -.6 | -.6 | -2.0 | -3.4 | -2.1 | -1.2 | -2.6 | -1.9 | -.5 | -.3 | -.3 | 1.3 | 1.1 | .3 | -.6 | -2.0 | -2.4 | -2.5 | -3.0 | -2.8 | -1.6 | -.6 | .5 | .2 | -1.0 | -4.1 | -6.4 | -6.3 |
| -3.3 | -2.4 | -3.2 | -4.2 | -6.2 | -6.4 | -4.0 | -1.7 | -2.2 | -1.6 | -2.2 | -1.6 | -6.4 | -4.4 | -3.1 | -4.1 | -1.9 | -.9 | -.8 | .5 | -.3 | -.2 | -.3 | -2.8 | -2.3 | -1.3 | -1.8 | -1.8 | -2.6 | -3.2 | -2.0 | -.9 | -.9 | -2.0 | -2.3 | -2.9 |
| -3.6 | -3.7 | -4.0 | -5.3 | -6.2 | -6.3 | -6.6 | -6.1 | -4.9 | -3.8 | -4.5 | -5.4 | -7.1 | -5.4 | -4.2 | -5.0 | -4.7 | -3.9 | -2.9 | -2.5 | -3.3 | -4.2 | -2.1 | -1.6 | -1.6 | -1.6 | -1.9 | -2.4 | -2.9 | -3.0 | -3.1 | -3.2 | -2.1 | -2.5 | -3.0 | -3.1 |
| -3.8 | -3.4 | -3.9 | -4.8 | -4.9 | -4.6 | -4.4 | -4.7 | -3.6 | -4.2 | -5.7 | -5.7 | -5.4 | -5.6 | -5.2 | -5.7 | -5.5 | -5.0 | -4.2 | -4.8 | -4.6 | -5.0 | -4.5 | -4.2 | -3.5 | -4.0 | -4.1 | -4.3 | -5.0 | -4.7 | -3.7 | -3.1 | -3.2 | -3.2 | -3.9 | -3.5 |
| -3.5 | -3.5 | -4.1 | -4.2 | -4.5 | -3.6 | -3.0 | -3.4 | -3.1 | -2.8 | -3.0 | -3.5 | -4.0 | -3.6 | -3.3 | -3.6 | -3.7 | -3.4 | -3.5 | -3.9 | -4.3 | -4.1 | -4.0 | -3.8 | -3.3 | -3.1 | -2.8 | -3.6 | -4.3 | -4.6 | -4.6 | -4.0 | -3.5 | -4.1 | -4.2 | -3.6 |
| -3.4 | -4.2 | -4.2 | -4.4 | -4.5 | -4.2 | -3.6 | -3.2 | -2.9 | -2.8 | -2.6 | -3.0 | -3.1 | -2.2 | -2.4 | -2.6 | -3.1 | -3.1 | -3.3 | -3.5 | -4.4 | -4.6 | -3.8 | -2.7 | -2.2 | -2.0 | -2.1 | -2.7 | -2.9 | -3.2 | -3.1 | -2.8 | -2.5 | -2.2 | -2.5 | -3.2 |
| -2.4 | -3.0 | -3.9 | -4.7 | -4.2 | -4.1 | -3.3 | -2.6 | -1.6 | -1.7 | -2.4 | -2.5 | -2.4 | -1.7 | -1.5 | -1.1 | -1.1 | -.8 | -.6 | -.8 | -.9 | -.2 | .4 | .7 | .5 | .5 | .7 | 1.0 | .8 | .9 | 1.0 | 1.0 | .7 | .3 | -1.3 | -2.3 |
| -.9 | -1.2 | -1.6 | -1.6 | -1.6 | -1.4 | -.6 | .5 | .7 | .2 | -.2 | -.6 | -.4 | -.1 | .3 | .7 | .9 | .9 | .9 | .8 | .9 | .9 | 1.0 | 1.3 | 1.6 | 1.7 | 1.7 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | .8 | .8 | -.5 | -.9 |

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

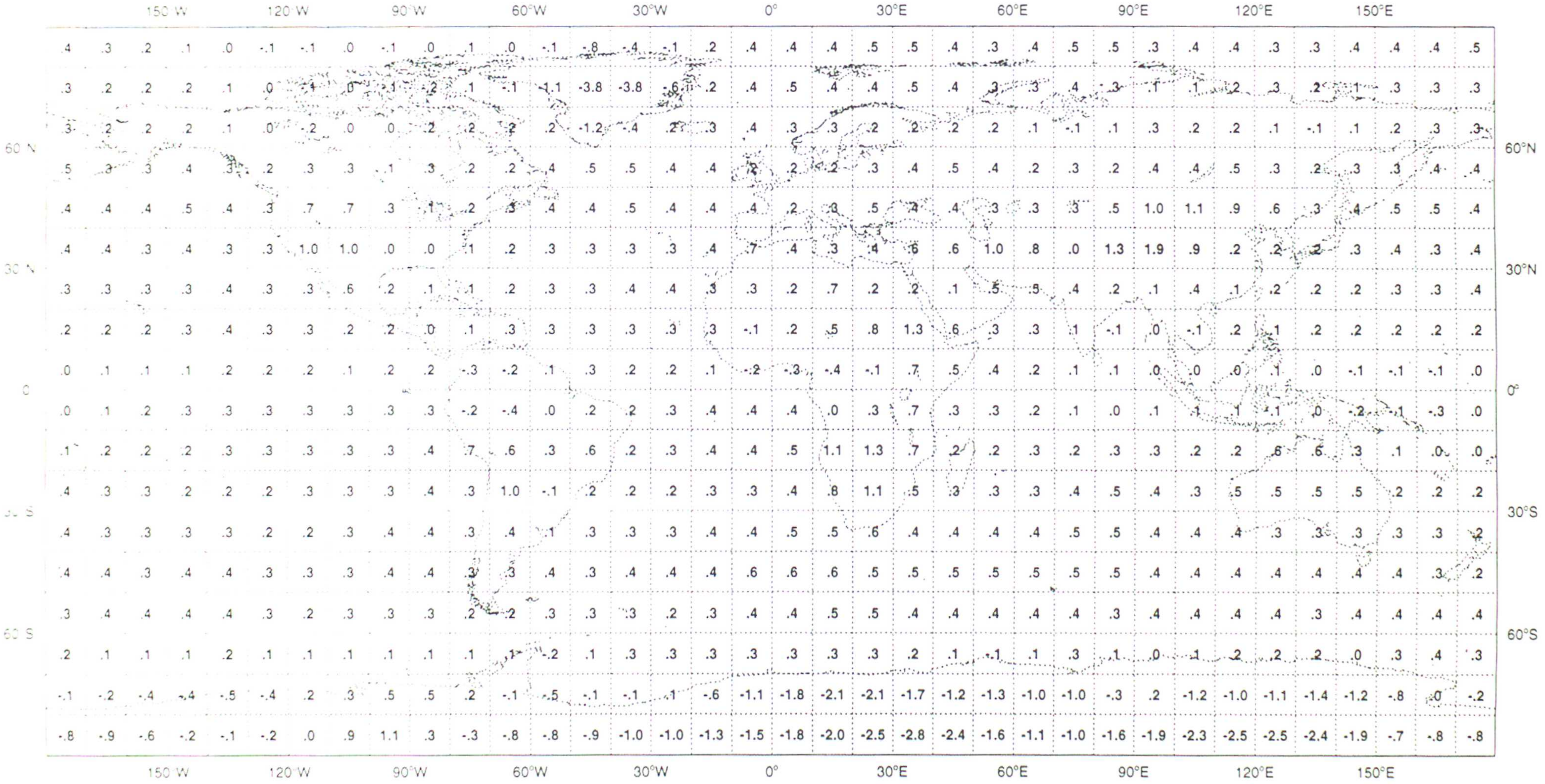

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .3 .2 .1 .0 -.1 -.1 .0 -.1 .0 .1 .0 -.1 -.8 -.4 -.1 .2 .4 .4 .4 .5 .5 .4 .3 .4 .5 .5 .3 .4 .4 .3 .3 .4 .4 .4 .5
.3 .2 .2 .2 .1 .0 -.1 .0 -.1 -.2 .1 -.1 -1.1 -3.8 -3.8 -.6 .2 .4 .5 .4 .4 .5 .4 .3 .3 .4 .3 .1 .1 .2 .3 .2 .1 .3 .3 .3
.3 .2 .2 .2 .1 .0 -.2 .0 .0 .2 .2 .2 .2 -1.2 -.4 .2 .3 .4 .3 .3 .2 .2 .2 .2 .1 -.1 .1 .3 .2 .2 .1 -.1 .1 .2 .3 .3
.5 .3 .3 .4 .3 .2 .3 .3 .1 .3 .2 .2 .4 .5 .5 .4 .4 .2 .2 .2 .3 .4 .5 .4 .2 .3 .2 .4 .4 .5 .3 .2 .3 .3 .4 .4
.4 .4 .4 .5 .4 .3 .7 .7 .3 .1 .2 .3 .4 .4 .5 .4 .4 .4 .2 .3 .5 .4 .4 .3 .3 .3 .5 1.0 1.1 .9 .6 .3 .4 .5 .5 .4
.4 .4 .3 .4 .3 .3 1.0 1.0 .0 .0 .1 .2 .3 .3 .3 .3 .4 .7 .4 .3 .4 .6 .6 1.0 .8 .0 1.3 1.9 .9 .2 .2 .2 .3 .4 .3 .4
.3 .3 .3 .3 .4 .3 .3 .6 .2 .1 .1 .2 .3 .3 .4 .4 .3 .3 .2 .7 .2 .2 .1 .5 .5 .4 .2 .1 .4 .1 .2 .2 .2 .3 .3 .4
.2 .2 .2 .3 .4 .3 .3 .2 .2 .0 .1 .3 .3 .3 .3 .3 .3 -.1 .2 .5 .8 1.3 .6 .3 .3 .1 -.1 .0 -.1 .2 .1 .2 .2 .2 .2 .2
.0 .1 .1 .1 .2 .2 .2 .1 .2 .2 -.3 -.2 .1 .3 .2 .2 .1 -.2 -.3 -.4 -.1 .7 .5 .4 .2 .1 .1 .0 .0 .0 .1 .0 -.1 -.1 -.1 .0
.0 .1 .2 .3 .3 .3 .3 .3 .3 .3 -.2 -.4 .0 .2 .2 .3 .4 .4 .4 .0 .3 .7 .3 .3 .2 .1 .0 .1 .1 .1 .1 .0 -.2 -.1 -.3 .0
.1 .2 .2 .2 .3 .3 .3 .3 .3 .4 .7 .6 .3 .6 .2 .3 .4 .4 .5 1.1 1.3 .7 .2 .2 .3 .2 .3 .3 .2 .2 .6 .6 .3 .1 .0 .0
.4 .3 .3 .2 .2 .2 .3 .3 .3 .4 .3 1.0 -.1 .2 .2 .2 .3 .3 .4 .8 1.1 .5 .3 .3 .3 .4 .5 .4 .3 .5 .5 .5 .5 .2 .2 .2
.4 .3 .3 .3 .3 .2 .2 .3 .4 .4 .3 .4 .1 .3 .3 .3 .4 .4 .5 .5 .6 .4 .4 .4 .4 .5 .5 .4 .4 .4 .3 .3 .3 .3 .3 .2
.4 .4 .3 .4 .4 .3 .3 .3 .4 .4 .3 .3 .4 .3 .4 .4 .4 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .3 .2
.3 .4 .4 .4 .4 .3 .2 .3 .3 .3 .2 .2 .3 .3 .3 .2 .3 .4 .4 .5 .5 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4
.2 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 -.2 .1 .3 .3 .3 .3 .3 .3 .3 .2 .1 -.1 .1 .3 .1 .0 .1 .2 .2 .2 .0 .3 .4 .3
-.1 -.2 -.4 -.4 -.5 -.4 .2 .3 .5 .5 .2 -.1 -.5 -.1 -.1 .1 -.6 -1.1 -1.8 -2.1 -2.1 -1.7 -1.2 -1.3 -1.0 -1.0 -.3 .2 -1.2 -1.0 -1.1 -1.4 -1.2 -.8 .0 -.2
-.8 -.9 -.6 -.2 -.1 -.2 .0 .9 1.1 .3 -.3 -.8 -.8 -.9 -1.0 -1.0 -1.3 -1.5 -1.8 -2.0 -2.5 -2.8 -2.4 -1.6 -1.1 -1.0 -1.6 -1.9 -2.3 -2.5 -2.5 -2.4 -1.9 -.7 -.8 -.8

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002

Channel: HIRS11 (500 - 700 hPa)

NOAA16, using all observations

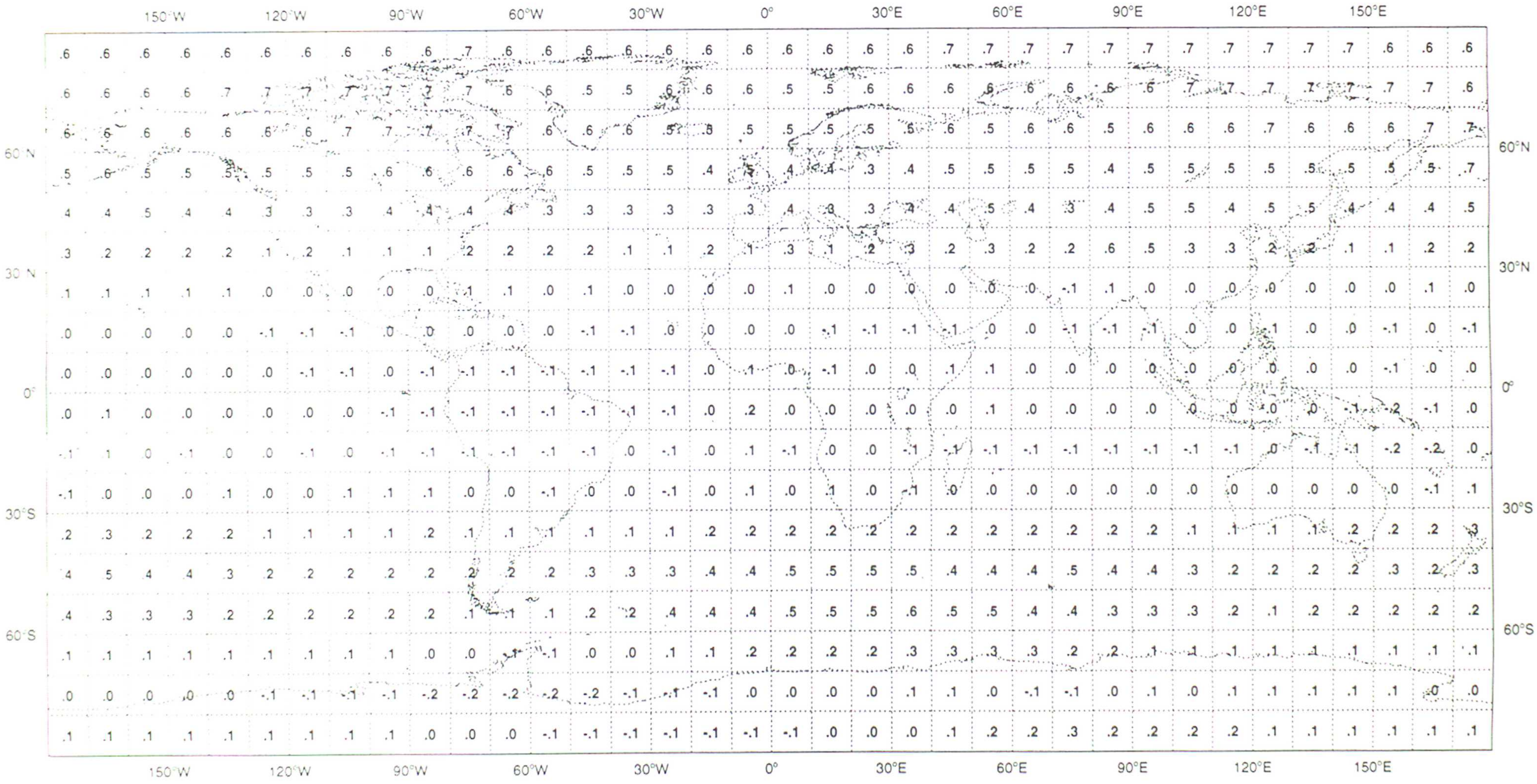

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

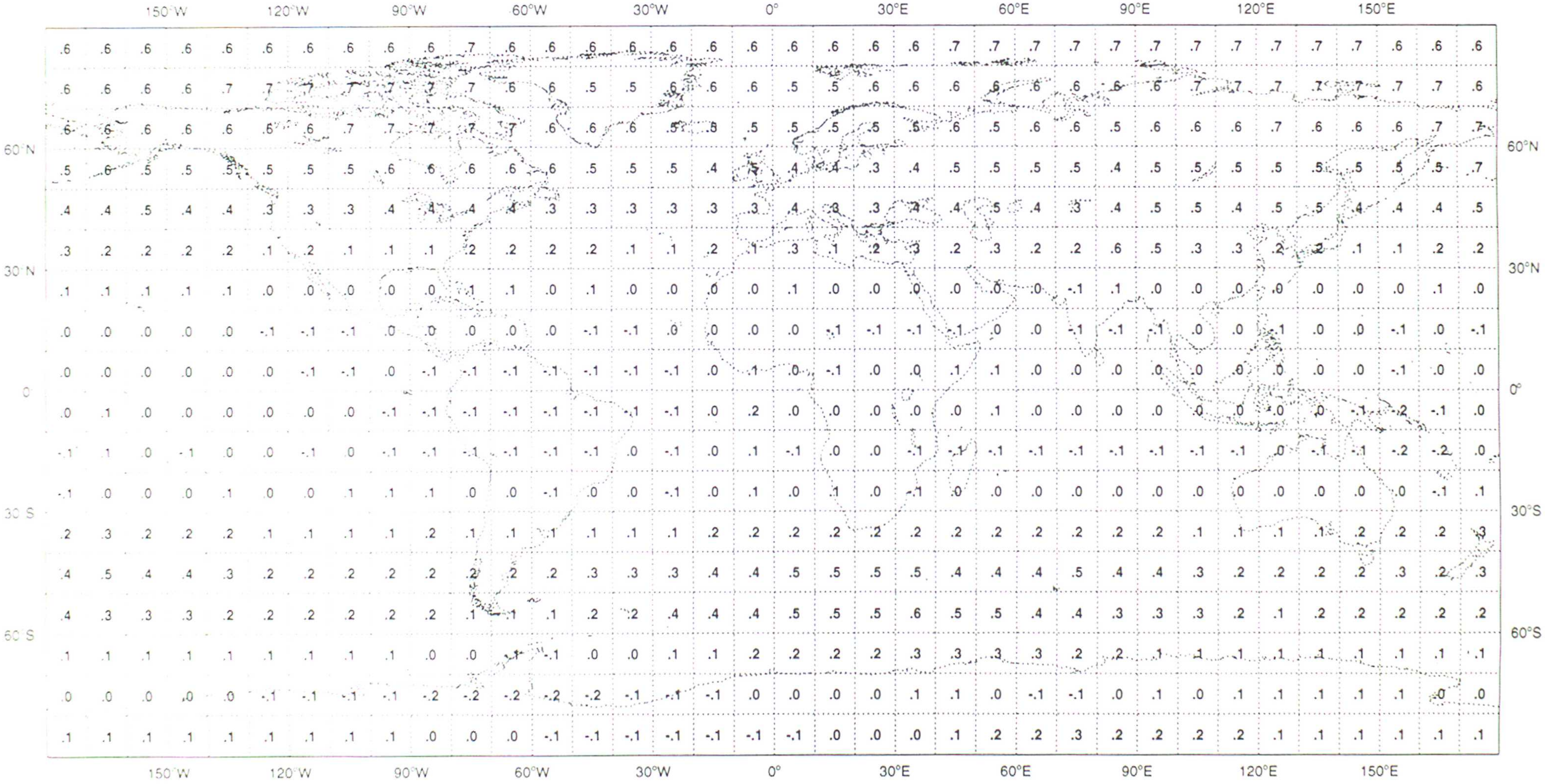

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .6
.6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .6 .6 .5 .5 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .7 .6
.6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .6 .5 .6 .6 .5 .6 .6 .6 .7 .6 .6 .6 .7 .7
.5 .6 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .5 .5 .5 .4 .5 .4 .4 .3 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .7
.4 .4 .5 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .5 .4 .3 .4 .5 .5 .4 .5 .5 .4 .4 .4 .5
.3 .2 .2 .2 .2 .1 .2 .1 .1 .1 .2 .2 .2 .2 .1 .1 .2 .1 .3 .1 .2 .3 .2 .3 .2 .2 .6 .5 .3 .3 .2 .2 .1 .1 .2 .2
.1 .1 .1 .1 .1 .0 .0 .0 .0 .0 .1 .1 .0 .1 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .0 -.1 .1 .0 .0 .0 .0 .0 .0 .0 .1 .0
.0 .0 .0 .0 .0 -.1 -.1 -.1 .0 .0 .0 .0 .0 -.1 -.1 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .0 .0 -.1 -.1 -.1 .0 .0 -.1 .0 .0 -.1 .0 -.1
.0 .0 .0 .0 .0 .0 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .1 .0 -.1 .0 .0 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 -.1 .0 .0
.0 .1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .2 .0 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .0 .0 .0 -.1 -.2 -.1 .0
-.1 .1 .0 -.1 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 .0 .1 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.2 -.2 .0
-.1 .0 .0 .0 .1 .0 .0 .1 .1 .1 .0 .0 -.1 .0 .0 -.1 .0 .1 .0 .1 .0 -.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 -.1 .1
.2 .3 .2 .2 .2 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .2 .3
.4 .5 .4 .4 .3 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .4 .4 .5 .5 .5 .5 .4 .4 .4 .5 .4 .4 .3 .2 .2 .2 .2 .3 .2 .3
.4 .3 .3 .3 .2 .2 .2 .2 .2 .2 .1 .1 .1 .2 .2 .4 .4 .4 .5 .5 .5 .6 .5 .5 .4 .4 .3 .3 .3 .2 .1 .2 .2 .2 .2 .2
.1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .1 -.1 .0 .0 .1 .1 .2 .2 .2 .2 .3 .3 .3 .3 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1
.0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.1 .0 .0 .0 .0 .1 .1 .0 -.1 -.1 .0 .1 .0 .1 .1 .1 .1 .1 .0 .0
.1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 .1 .2 .2 .3 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

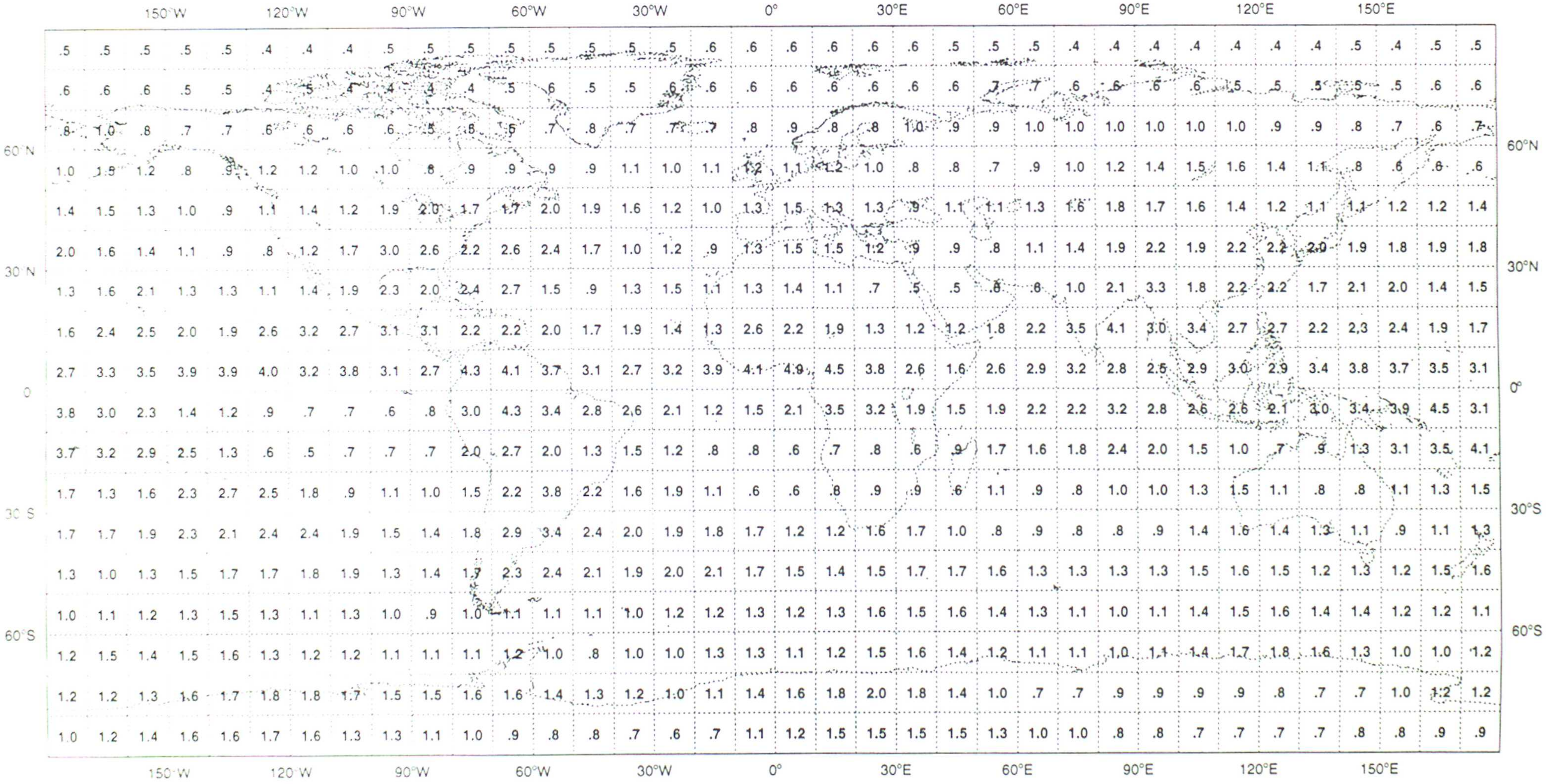
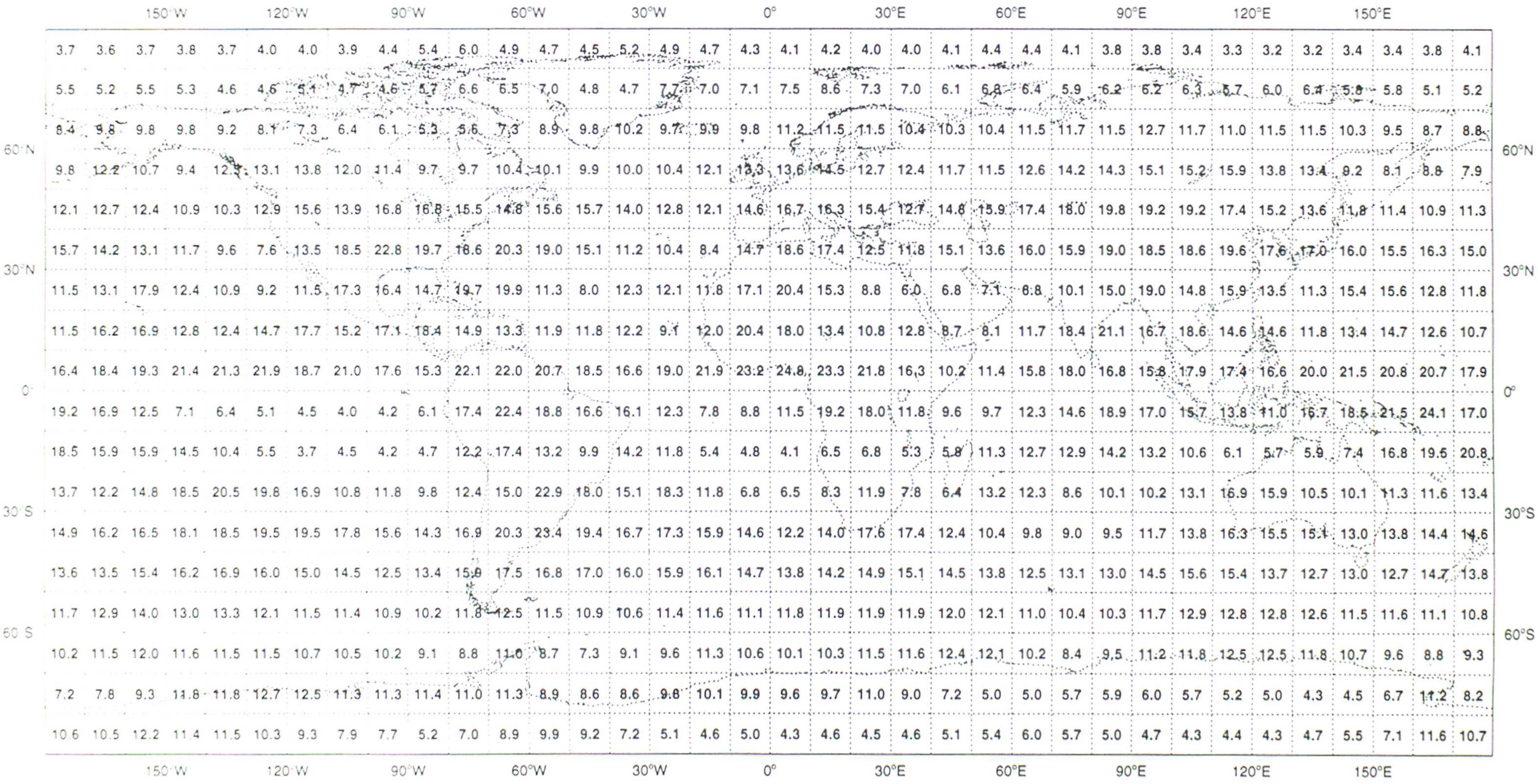

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0
30°S
60°S
.5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5
.6 .6 .6 .5 .5 .4 .5 .4 .4 .4 .4 .5 .6 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .5 .5 .5 .5 .5 .6 .6
.8 1.0 .8 .7 .7 .6 .6 .6 .6 .5 .6 .6 .7 .8 .7 .7 .7 .8 .9 .8 .8 1.0 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .8 .7 .6 .7
1.0 1.5 1.2 .8 .9 1.2 1.2 1.0 1.0 .8 .9 .9 .9 .9 1.1 1.0 1.1 1.2 1.1 1.2 1.0 .8 .8 .7 .9 1.0 1.2 1.4 1.5 1.6 1.4 1.1 .8 .6 .6 .6
1.4 1.5 1.3 1.0 .9 1.1 1.4 1.2 1.9 2.0 1.7 1.7 2.0 1.9 1.6 1.2 1.0 1.3 1.5 1.3 1.3 .9 1.1 1.1 1.3 1.6 1.8 1.7 1.6 1.4 1.2 1.1 1.1 1.2 1.2 1.4
2.0 1.6 1.4 1.1 .9 .8 1.2 1.7 3.0 2.6 2.2 2.6 2.4 1.7 1.0 1.2 .9 1.3 1.5 1.5 1.2 .9 .9 .8 1.1 1.4 1.9 2.2 1.9 2.2 2.2 2.0 1.9 1.8 1.9 1.8
1.3 1.6 2.1 1.3 1.3 1.1 1.4 1.9 2.3 2.0 2.4 2.7 1.5 .9 1.3 1.5 1.1 1.3 1.4 1.1 .7 .5 .5 .8 .6 1.0 2.1 3.3 1.8 2.2 2.2 1.7 2.1 2.0 1.4 1.5
1.6 2.4 2.5 2.0 1.9 2.6 3.2 2.7 3.1 3.1 2.2 2.2 2.0 1.7 1.9 1.4 1.3 2.6 2.2 1.9 1.3 1.2 1.2 1.8 2.2 3.5 4.1 3.0 3.4 2.7 2.7 2.2 2.3 2.4 1.9 1.7
2.7 3.3 3.5 3.9 3.9 4.0 3.2 3.8 3.1 2.7 4.3 4.1 3.7 3.1 2.7 3.2 3.9 4.1 4.9 4.5 3.8 2.6 1.6 2.6 2.9 3.2 2.8 2.5 2.9 3.0 2.9 3.4 3.8 3.7 3.5 3.1
3.8 3.0 2.3 1.4 1.2 .9 .7 .7 .6 .8 3.0 4.3 3.4 2.8 2.6 2.1 1.2 1.5 2.1 3.5 3.2 1.9 1.5 1.9 2.2 2.2 3.2 2.8 2.6 2.6 2.1 3.0 3.4 3.9 4.5 3.1
3.7 3.2 2.9 2.5 1.3 .6 .5 .7 .7 .7 2.0 2.7 2.0 1.3 1.5 1.2 .8 .8 .6 .7 .8 .6 .9 1.7 1.6 1.8 2.4 2.0 1.5 1.0 .7 .9 1.3 3.1 3.5 4.1
1.7 1.3 1.6 2.3 2.7 2.5 1.8 .9 1.1 1.0 1.5 2.2 3.8 2.2 1.6 1.9 1.1 .6 .6 .8 .9 .9 .6 1.1 .9 .8 1.0 1.0 1.3 1.5 1.1 .8 .8 1.1 1.3 1.5
1.7 1.7 1.9 2.3 2.1 2.4 2.4 1.9 1.5 1.4 1.8 2.9 3.4 2.4 2.0 1.9 1.8 1.7 1.2 1.2 1.6 1.7 1.0 .8 .9 .8 .8 .9 1.4 1.6 1.4 1.3 1.1 .9 1.1 1.3
1.3 1.0 1.3 1.5 1.7 1.7 1.8 1.9 1.3 1.4 1.7 2.3 2.4 2.1 1.9 2.0 2.1 1.7 1.5 1.4 1.5 1.7 1.7 1.6 1.3 1.3 1.3 1.3 1.5 1.6 1.5 1.2 1.3 1.2 1.5 1.6
1.0 1.1 1.2 1.3 1.5 1.3 1.1 1.3 1.0 .9 1.0 1.1 1.1 1.1 1.0 1.2 1.2 1.3 1.2 1.3 1.6 1.5 1.6 1.4 1.3 1.1 1.0 1.1 1.4 1.5 1.6 1.4 1.4 1.2 1.2 1.1
1.2 1.5 1.4 1.5 1.6 1.3 1.2 1.2 1.1 1.1 1.1 1.2 1.0 .8 1.0 1.0 1.3 1.3 1.1 1.2 1.5 1.6 1.4 1.2 1.1 1.1 1.0 1.1 1.4 1.7 1.8 1.6 1.3 1.0 1.0 1.2
1.2 1.2 1.3 1.6 1.7 1.8 1.8 1.7 1.5 1.5 1.6 1.6 1.4 1.3 1.2 1.0 1.1 1.4 1.6 1.8 2.0 1.8 1.4 1.0 .7 .7 .9 .9 .9 .9 .8 .7 .7 1.0 1.2 1.2
1.0 1.2 1.4 1.6 1.6 1.7 1.6 1.3 1.3 1.1 1.0 .9 .8 .8 .7 .6 .7 1.1 1.2 1.5 1.5 1.5 1.5 1.3 1.0 1.0 .8 .8 .7 .7 .7 .7 .8 .8 .9 .9

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



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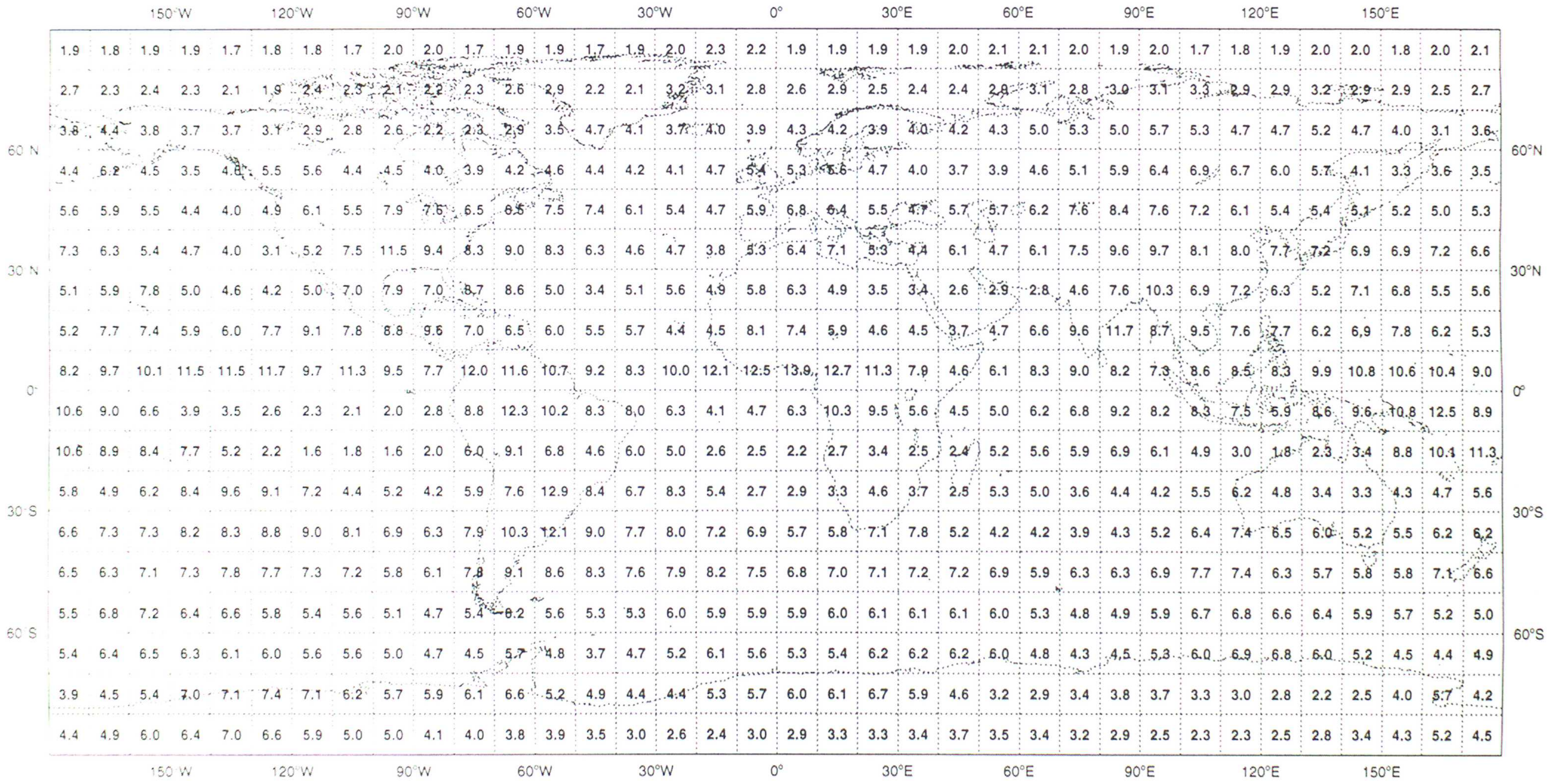
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.7 | 3.6 | 3.7 | 3.8 | 3.7 | 4.0 | 4.0 | 3.9 | 4.4 | 5.4 | 6.0 | 4.9 | 4.7 | 4.5 | 5.2 | 4.9 | 4.7 | 4.3 | 4.1 | 4.2 | 4.0 | 4.0 | 4.1 | 4.4 | 4.4 | 4.1 | 3.8 | 3.8 | 3.4 | 3.3 | 3.2 | 3.2 | 3.4 | 3.4 | 3.8 | 4.1 |
| 5.5 | 5.2 | 5.5 | 5.3 | 4.6 | 4.6 | 5.1 | 4.7 | 4.6 | 5.7 | 6.6 | 6.5 | 7.0 | 4.8 | 4.7 | 7.7 | 7.0 | 7.1 | 7.5 | 8.6 | 7.3 | 7.0 | 6.1 | 6.8 | 6.4 | 5.9 | 6.2 | 6.2 | 6.3 | 5.7 | 6.0 | 6.4 | 5.8 | 5.8 | 5.1 | 5.2 |
| 8.4 | 9.8 | 9.8 | 9.8 | 9.2 | 8.1 | 7.3 | 6.4 | 6.1 | 5.3 | 5.6 | 7.3 | 8.9 | 9.8 | 10.2 | 9.7 | 9.9 | 9.8 | 11.2 | 11.5 | 11.5 | 10.4 | 10.3 | 10.4 | 11.5 | 11.7 | 11.5 | 12.7 | 11.7 | 11.0 | 11.5 | 11.5 | 10.3 | 9.5 | 8.7 | 8.8 |
| 9.8 | 12.2 | 10.7 | 9.4 | 12.5 | 13.1 | 13.8 | 12.0 | 11.4 | 9.7 | 9.7 | 10.4 | 10.1 | 9.9 | 10.0 | 10.4 | 12.1 | 13.3 | 13.6 | 14.5 | 12.7 | 12.4 | 11.7 | 11.5 | 12.6 | 14.2 | 14.3 | 15.1 | 15.2 | 15.9 | 13.8 | 13.4 | 9.2 | 8.1 | 8.8 | 7.9 |
| 12.1 | 12.7 | 12.4 | 10.9 | 10.3 | 12.9 | 15.6 | 13.9 | 16.8 | 16.8 | 15.5 | 14.8 | 15.6 | 15.7 | 14.0 | 12.8 | 12.1 | 14.6 | 16.7 | 16.3 | 15.4 | 12.7 | 14.8 | 15.9 | 17.4 | 18.0 | 19.8 | 19.2 | 19.2 | 17.4 | 15.2 | 13.6 | 11.8 | 11.4 | 10.9 | 11.3 |
| 15.7 | 14.2 | 13.1 | 11.7 | 9.6 | 7.6 | 13.5 | 18.5 | 22.8 | 19.7 | 18.6 | 20.3 | 19.0 | 15.1 | 11.2 | 10.4 | 8.4 | 14.7 | 18.6 | 17.4 | 12.5 | 11.8 | 15.1 | 13.6 | 16.0 | 15.9 | 19.0 | 18.5 | 18.6 | 19.6 | 17.6 | 17.0 | 16.0 | 15.5 | 16.3 | 15.0 |
| 11.5 | 13.1 | 17.9 | 12.4 | 10.9 | 9.2 | 11.5 | 17.3 | 16.4 | 14.7 | 19.7 | 19.9 | 11.3 | 8.0 | 12.3 | 12.1 | 11.8 | 17.1 | 20.4 | 15.3 | 8.8 | 6.0 | 6.8 | 7.1 | 6.8 | 10.1 | 15.0 | 19.0 | 14.8 | 15.9 | 13.5 | 11.3 | 15.4 | 15.6 | 12.8 | 11.8 |
| 11.5 | 16.2 | 16.9 | 12.8 | 12.4 | 14.7 | 17.7 | 15.2 | 17.1 | 18.4 | 14.9 | 13.3 | 11.9 | 11.8 | 12.2 | 9.1 | 12.0 | 20.4 | 18.0 | 13.4 | 10.8 | 12.8 | 8.7 | 8.1 | 11.7 | 18.4 | 21.1 | 16.7 | 18.6 | 14.6 | 14.6 | 11.8 | 13.4 | 14.7 | 12.6 | 10.7 |
| 16.4 | 18.4 | 19.3 | 21.4 | 21.3 | 21.9 | 18.7 | 21.0 | 17.6 | 15.3 | 22.1 | 22.0 | 20.7 | 18.5 | 16.6 | 19.0 | 21.9 | 23.2 | 24.8 | 23.3 | 21.8 | 16.3 | 10.2 | 11.4 | 15.8 | 18.0 | 16.8 | 15.8 | 17.9 | 17.4 | 16.6 | 20.0 | 21.5 | 20.8 | 20.7 | 17.9 |
| 19.2 | 16.9 | 12.5 | 7.1 | 6.4 | 5.1 | 4.5 | 4.0 | 4.2 | 6.1 | 17.4 | 22.4 | 18.8 | 16.6 | 16.1 | 12.3 | 7.8 | 8.8 | 11.5 | 19.2 | 18.0 | 11.8 | 9.6 | 9.7 | 12.3 | 14.6 | 18.9 | 17.0 | 15.7 | 13.8 | 11.0 | 16.7 | 18.5 | 21.5 | 24.1 | 17.0 |
| 18.5 | 15.9 | 15.9 | 14.5 | 10.4 | 5.5 | 3.7 | 4.5 | 4.2 | 4.7 | 12.2 | 17.4 | 13.2 | 9.9 | 14.2 | 11.8 | 5.4 | 4.8 | 4.1 | 6.5 | 6.8 | 5.3 | 5.8 | 11.3 | 12.7 | 12.9 | 14.2 | 13.2 | 10.6 | 6.1 | 5.7 | 5.9 | 7.4 | 16.8 | 19.5 | 20.8 |
| 13.7 | 12.2 | 14.8 | 18.5 | 20.5 | 19.8 | 16.9 | 10.8 | 11.8 | 9.8 | 12.4 | 15.0 | 22.9 | 18.0 | 15.1 | 18.3 | 11.8 | 6.8 | 6.5 | 8.3 | 11.9 | 7.8 | 6.4 | 13.2 | 12.3 | 8.6 | 10.1 | 10.2 | 13.1 | 16.9 | 15.9 | 10.5 | 10.1 | 11.3 | 11.6 | 13.4 |
| 14.9 | 16.2 | 16.5 | 18.1 | 18.5 | 19.5 | 19.5 | 17.8 | 15.6 | 14.3 | 16.9 | 20.3 | 23.4 | 19.4 | 16.7 | 17.3 | 15.9 | 14.6 | 12.2 | 14.0 | 17.6 | 17.4 | 12.4 | 10.4 | 9.8 | 9.0 | 9.5 | 11.7 | 13.8 | 16.3 | 15.5 | 15.1 | 13.0 | 13.8 | 14.4 | 14.6 |
| 13.6 | 13.5 | 15.4 | 16.2 | 16.9 | 16.0 | 15.0 | 14.5 | 12.5 | 13.4 | 15.9 | 17.5 | 16.8 | 17.0 | 16.0 | 15.9 | 16.1 | 14.7 | 13.8 | 14.2 | 14.9 | 15.1 | 14.5 | 13.8 | 12.5 | 13.1 | 13.0 | 14.5 | 15.6 | 15.4 | 13.7 | 12.7 | 13.0 | 12.7 | 14.7 | 13.8 |
| 11.7 | 12.9 | 14.0 | 13.0 | 13.3 | 12.1 | 11.5 | 11.4 | 10.9 | 10.2 | 11.8 | 12.5 | 11.5 | 10.9 | 10.6 | 11.4 | 11.6 | 11.1 | 11.8 | 11.9 | 11.9 | 11.9 | 12.0 | 12.1 | 11.0 | 10.4 | 10.3 | 11.7 | 12.9 | 12.8 | 12.8 | 12.6 | 11.5 | 11.6 | 11.1 | 10.8 |
| 10.2 | 11.5 | 12.0 | 11.6 | 11.5 | 11.5 | 10.7 | 10.5 | 10.2 | 9.1 | 8.8 | 11.0 | 8.7 | 7.3 | 9.1 | 9.6 | 11.3 | 10.6 | 10.1 | 10.3 | 11.5 | 11.6 | 12.4 | 12.1 | 10.2 | 8.4 | 9.5 | 11.2 | 11.8 | 12.5 | 12.5 | 11.8 | 10.7 | 9.6 | 8.8 | 9.3 |
| 7.2 | 7.8 | 9.3 | 11.8 | 11.8 | 12.7 | 12.5 | 11.3 | 11.3 | 11.4 | 11.0 | 11.3 | 8.9 | 8.6 | 8.6 | 9.8 | 10.1 | 9.9 | 9.6 | 9.7 | 11.0 | 9.0 | 7.2 | 5.0 | 5.0 | 5.7 | 5.9 | 6.0 | 5.7 | 5.2 | 5.0 | 4.3 | 4.5 | 6.7 | 11.2 | 8.2 |
| 10.6 | 10.5 | 12.2 | 11.4 | 11.5 | 10.3 | 9.3 | 7.9 | 7.7 | 5.2 | 7.0 | 8.9 | 9.9 | 9.2 | 7.2 | 5.1 | 4.6 | 5.0 | 4.3 | 4.6 | 4.5 | 4.6 | 5.1 | 5.4 | 6.0 | 5.7 | 5.0 | 4.7 | 4.3 | 4.4 | 4.3 | 4.7 | 5.5 | 7.1 | 11.6 | 10.7 |

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002

Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations



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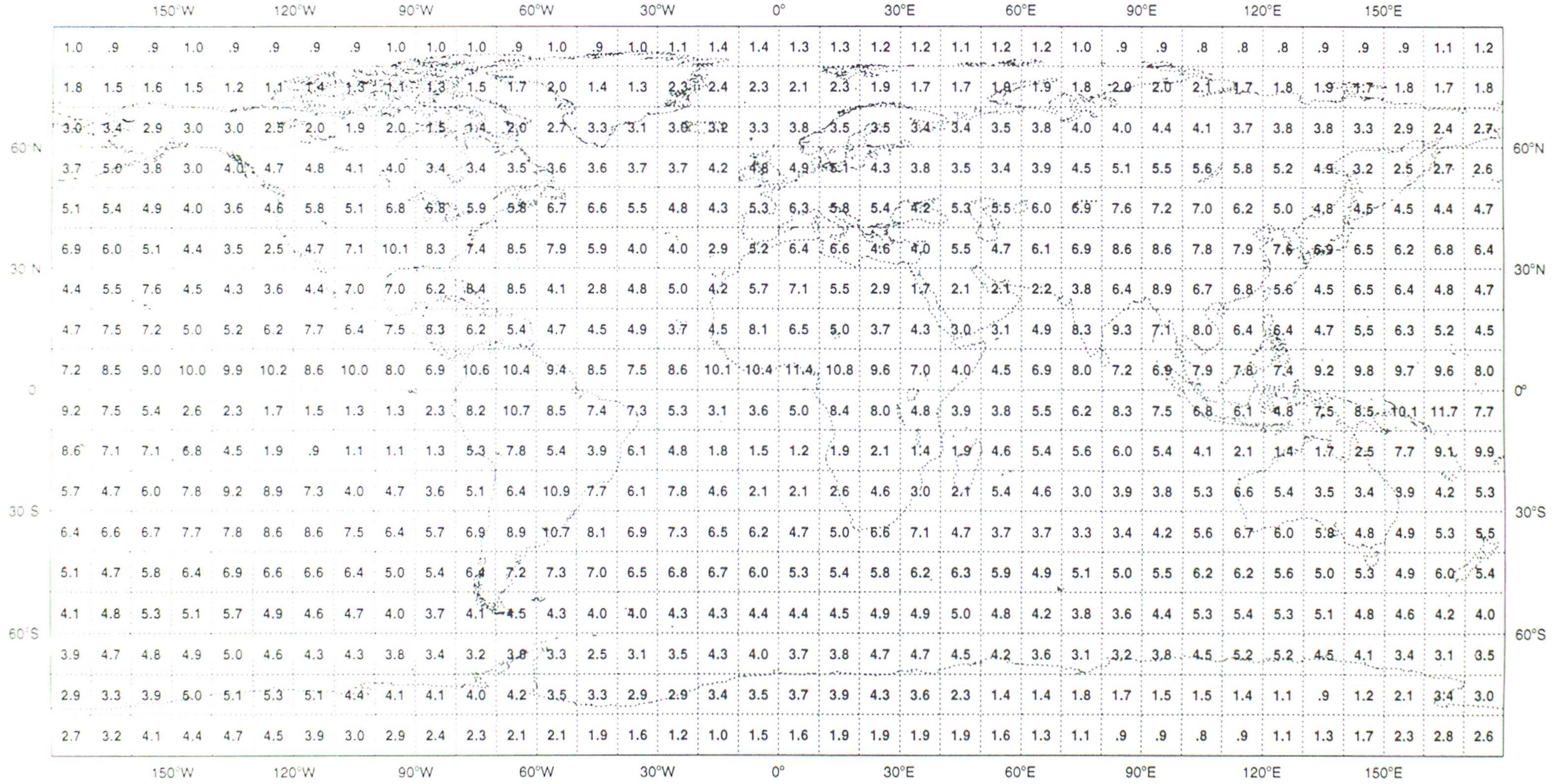
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.9 | 1.8 | 1.9 | 1.9 | 1.7 | 1.8 | 1.8 | 1.7 | 2.0 | 2.0 | 1.7 | 1.9 | 1.9 | 1.7 | 1.9 | 2.0 | 2.3 | 2.2 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.1 | 2.1 | 2.0 | 1.9 | 2.0 | 1.7 | 1.8 | 1.9 | 2.0 | 2.0 | 1.8 | 2.0 | 2.1 |
| 2.7 | 2.3 | 2.4 | 2.3 | 2.1 | 1.9 | 2.4 | 2.3 | 2.1 | 2.2 | 2.3 | 2.6 | 2.9 | 2.2 | 2.1 | 3.2 | 3.1 | 2.8 | 2.6 | 2.9 | 2.5 | 2.4 | 2.4 | 2.8 | 3.1 | 2.8 | 3.0 | 3.1 | 3.3 | 2.9 | 2.9 | 3.2 | 2.9 | 2.9 | 2.5 | 2.7 |
| 3.8 | 4.4 | 3.8 | 3.7 | 3.7 | 3.1 | 2.9 | 2.8 | 2.6 | 2.2 | 2.3 | 2.9 | 3.5 | 4.7 | 4.1 | 3.7 | 4.0 | 3.9 | 4.3 | 4.2 | 3.9 | 4.0 | 4.2 | 4.3 | 5.0 | 5.3 | 5.0 | 5.7 | 5.3 | 4.7 | 4.7 | 5.2 | 4.7 | 4.0 | 3.1 | 3.6 |
| 4.4 | 6.2 | 4.5 | 3.5 | 4.8 | 5.5 | 5.6 | 4.4 | 4.5 | 4.0 | 3.9 | 4.2 | 4.6 | 4.4 | 4.2 | 4.1 | 4.7 | 5.4 | 5.3 | 5.6 | 4.7 | 4.0 | 3.7 | 3.9 | 4.6 | 5.1 | 5.9 | 6.4 | 6.9 | 6.7 | 6.0 | 5.7 | 4.1 | 3.3 | 3.6 | 3.5 |
| 5.6 | 5.9 | 5.5 | 4.4 | 4.0 | 4.9 | 6.1 | 5.5 | 7.9 | 7.6 | 6.5 | 6.5 | 7.5 | 7.4 | 6.1 | 5.4 | 4.7 | 5.9 | 6.8 | 6.4 | 5.5 | 4.7 | 5.7 | 5.7 | 6.2 | 7.6 | 8.4 | 7.6 | 7.2 | 6.1 | 5.4 | 5.4 | 5.1 | 5.2 | 5.0 | 5.3 |
| 7.3 | 6.3 | 5.4 | 4.7 | 4.0 | 3.1 | 5.2 | 7.5 | 11.5 | 9.4 | 8.3 | 9.0 | 8.3 | 6.3 | 4.6 | 4.7 | 3.8 | 5.3 | 6.4 | 7.1 | 5.3 | 4.4 | 6.1 | 4.7 | 6.1 | 7.5 | 9.6 | 9.7 | 8.1 | 8.0 | 7.7 | 7.2 | 6.9 | 6.9 | 7.2 | 6.6 |
| 5.1 | 5.9 | 7.8 | 5.0 | 4.6 | 4.2 | 5.0 | 7.0 | 7.9 | 7.0 | 8.7 | 8.6 | 5.0 | 3.4 | 5.1 | 5.6 | 4.9 | 5.8 | 6.3 | 4.9 | 3.5 | 3.4 | 2.6 | 2.9 | 2.8 | 4.6 | 7.6 | 10.3 | 6.9 | 7.2 | 6.3 | 5.2 | 7.1 | 6.8 | 5.5 | 5.6 |
| 5.2 | 7.7 | 7.4 | 5.9 | 6.0 | 7.7 | 9.1 | 7.8 | 8.8 | 9.6 | 7.0 | 6.5 | 6.0 | 5.5 | 5.7 | 4.4 | 4.5 | 8.1 | 7.4 | 5.9 | 4.6 | 4.5 | 3.7 | 4.7 | 6.6 | 9.6 | 11.7 | 8.7 | 9.5 | 7.6 | 7.7 | 6.2 | 6.9 | 7.8 | 6.2 | 5.3 |
| 8.2 | 9.7 | 10.1 | 11.5 | 11.5 | 11.7 | 9.7 | 11.3 | 9.5 | 7.7 | 12.0 | 11.6 | 10.7 | 9.2 | 8.3 | 10.0 | 12.1 | 12.5 | 13.9 | 12.7 | 11.3 | 7.9 | 4.6 | 6.1 | 8.3 | 9.0 | 8.2 | 7.3 | 8.6 | 8.5 | 8.3 | 9.9 | 10.8 | 10.6 | 10.4 | 9.0 |
| 10.6 | 9.0 | 6.6 | 3.9 | 3.5 | 2.6 | 2.3 | 2.1 | 2.0 | 2.8 | 8.8 | 12.3 | 10.2 | 8.3 | 8.0 | 6.3 | 4.1 | 4.7 | 6.3 | 10.3 | 9.5 | 5.6 | 4.5 | 5.0 | 6.2 | 6.8 | 9.2 | 8.2 | 8.3 | 7.5 | 5.9 | 8.6 | 9.6 | 10.8 | 12.5 | 8.9 |
| 10.6 | 8.9 | 8.4 | 7.7 | 5.2 | 2.2 | 1.6 | 1.8 | 1.6 | 2.0 | 6.0 | 9.1 | 6.8 | 4.6 | 6.0 | 5.0 | 2.6 | 2.5 | 2.2 | 2.7 | 3.4 | 2.5 | 2.4 | 5.2 | 5.6 | 5.9 | 6.9 | 6.1 | 4.9 | 3.0 | 1.8 | 2.3 | 3.4 | 8.8 | 10.1 | 11.3 |
| 5.8 | 4.9 | 6.2 | 8.4 | 9.6 | 9.1 | 7.2 | 4.4 | 5.2 | 4.2 | 5.9 | 7.6 | 12.9 | 8.4 | 6.7 | 8.3 | 5.4 | 2.7 | 2.9 | 3.3 | 4.6 | 3.7 | 2.5 | 5.3 | 5.0 | 3.6 | 4.4 | 4.2 | 5.5 | 6.2 | 4.8 | 3.4 | 3.3 | 4.3 | 4.7 | 5.6 |
| 6.6 | 7.3 | 7.3 | 8.2 | 8.3 | 8.8 | 9.0 | 8.1 | 6.9 | 6.3 | 7.9 | 10.3 | 12.1 | 9.0 | 7.7 | 8.0 | 7.2 | 6.9 | 5.7 | 5.8 | 7.1 | 7.8 | 5.2 | 4.2 | 4.2 | 3.9 | 4.3 | 5.2 | 6.4 | 7.4 | 6.5 | 6.0 | 5.2 | 5.5 | 6.2 | 6.2 |
| 6.5 | 6.3 | 7.1 | 7.3 | 7.8 | 7.7 | 7.3 | 7.2 | 5.8 | 6.1 | 7.8 | 9.1 | 8.6 | 8.3 | 7.6 | 7.9 | 8.2 | 7.5 | 6.8 | 7.0 | 7.1 | 7.2 | 7.2 | 6.9 | 5.9 | 6.3 | 6.3 | 6.9 | 7.7 | 7.4 | 6.3 | 5.7 | 5.8 | 5.8 | 7.1 | 6.6 |
| 5.5 | 6.8 | 7.2 | 6.4 | 6.6 | 5.8 | 5.4 | 5.6 | 5.1 | 4.7 | 5.4 | 6.2 | 5.6 | 5.3 | 5.3 | 6.0 | 5.9 | 5.9 | 5.9 | 6.0 | 6.1 | 6.1 | 6.1 | 6.0 | 5.3 | 4.8 | 4.9 | 5.9 | 6.7 | 6.8 | 6.6 | 6.4 | 5.9 | 5.7 | 5.2 | 5.0 |
| 5.4 | 6.4 | 6.5 | 6.3 | 6.1 | 6.0 | 5.6 | 5.6 | 5.0 | 4.7 | 4.5 | 5.7 | 4.8 | 3.7 | 4.7 | 5.2 | 6.1 | 5.6 | 5.3 | 5.4 | 6.2 | 6.2 | 6.2 | 6.0 | 4.8 | 4.3 | 4.5 | 5.3 | 6.0 | 6.9 | 6.8 | 6.0 | 5.2 | 4.5 | 4.4 | 4.9 |
| 3.9 | 4.5 | 5.4 | 7.0 | 7.1 | 7.4 | 7.1 | 6.2 | 5.7 | 5.9 | 6.1 | 6.6 | 5.2 | 4.9 | 4.4 | 4.4 | 5.3 | 5.7 | 6.0 | 6.1 | 6.7 | 5.9 | 4.6 | 3.2 | 2.9 | 3.4 | 3.8 | 3.7 | 3.3 | 3.0 | 2.8 | 2.2 | 2.5 | 4.0 | 5.7 | 4.2 |
| 4.4 | 4.9 | 6.0 | 6.4 | 7.0 | 6.6 | 5.9 | 5.0 | 5.0 | 4.1 | 4.0 | 3.8 | 3.9 | 3.5 | 3.0 | 2.6 | 2.4 | 3.0 | 2.9 | 3.3 | 3.3 | 3.4 | 3.7 | 3.5 | 3.4 | 3.2 | 2.9 | 2.5 | 2.3 | 2.3 | 2.5 | 2.8 | 3.4 | 4.3 | 5.2 | 4.5 |

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



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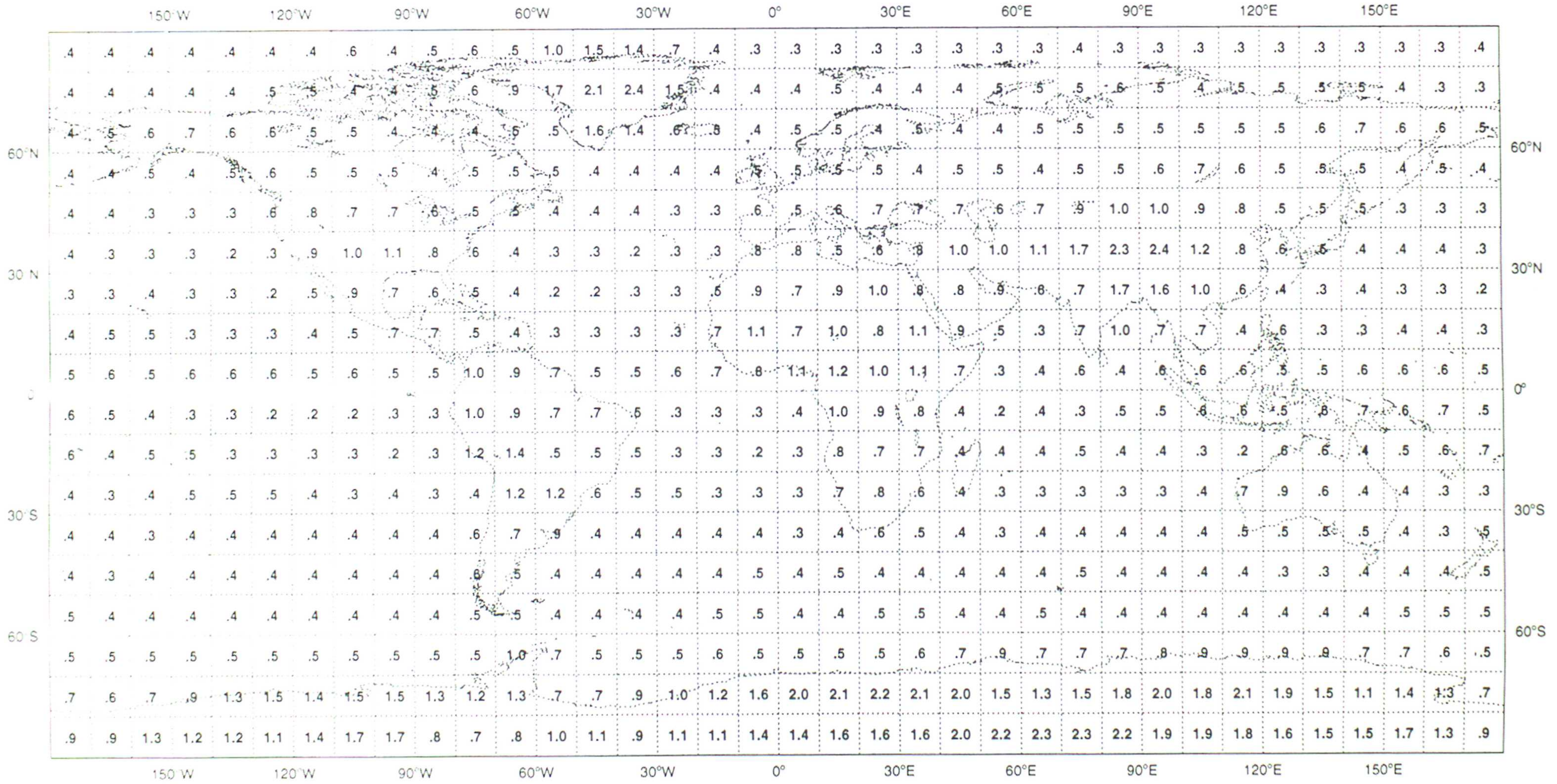
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | .9 | .9 | 1.0 | .9 | .9 | .9 | .9 | 1.0 | 1.0 | 1.0 | .9 | 1.0 | .9 | 1.0 | 1.1 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.0 | .9 | .9 | .8 | .8 | .8 | .9 | .9 | .9 | 1.1 | 1.2 |
| 1.8 | 1.5 | 1.6 | 1.5 | 1.2 | 1.1 | 1.4 | 1.3 | 1.1 | 1.3 | 1.5 | 1.7 | 2.0 | 1.4 | 1.3 | 2.3 | 2.4 | 2.3 | 2.1 | 2.3 | 1.9 | 1.7 | 1.7 | 1.8 | 1.9 | 1.8 | 2.9 | 2.0 | 2.1 | 1.7 | 1.8 | 1.9 | 1.7 | 1.8 | 1.7 | 1.8 |
| 3.0 | 3.4 | 2.9 | 3.0 | 3.0 | 2.5 | 2.0 | 1.9 | 2.0 | 1.5 | 1.4 | 2.0 | 2.7 | 3.3 | 3.1 | 3.6 | 3.2 | 3.3 | 3.8 | 3.5 | 3.5 | 3.4 | 3.4 | 3.5 | 3.8 | 4.0 | 4.0 | 4.4 | 4.1 | 3.7 | 3.8 | 3.8 | 3.3 | 2.9 | 2.4 | 2.7 |
| 3.7 | 5.0 | 3.8 | 3.0 | 4.0 | 4.7 | 4.8 | 4.1 | 4.0 | 3.4 | 3.4 | 3.5 | 3.6 | 3.6 | 3.7 | 3.7 | 4.2 | 4.8 | 4.9 | 5.1 | 4.3 | 3.8 | 3.5 | 3.4 | 3.9 | 4.5 | 5.1 | 5.5 | 5.6 | 5.8 | 5.2 | 4.9 | 3.2 | 2.5 | 2.7 | 2.6 |
| 5.1 | 5.4 | 4.9 | 4.0 | 3.6 | 4.6 | 5.8 | 5.1 | 6.8 | 6.8 | 5.9 | 5.8 | 6.7 | 6.6 | 5.5 | 4.8 | 4.3 | 5.3 | 6.3 | 5.8 | 5.4 | 4.2 | 5.3 | 5.5 | 6.0 | 6.9 | 7.6 | 7.2 | 7.0 | 6.2 | 5.0 | 4.8 | 4.5 | 4.5 | 4.4 | 4.7 |
| 6.9 | 6.0 | 5.1 | 4.4 | 3.5 | 2.5 | 4.7 | 7.1 | 10.1 | 8.3 | 7.4 | 8.5 | 7.9 | 5.9 | 4.0 | 4.0 | 2.9 | 5.2 | 6.4 | 6.6 | 4.6 | 4.0 | 5.5 | 4.7 | 6.1 | 6.9 | 8.6 | 8.6 | 7.8 | 7.9 | 7.6 | 6.9 | 6.5 | 6.2 | 6.8 | 6.4 |
| 4.4 | 5.5 | 7.6 | 4.5 | 4.3 | 3.6 | 4.4 | 7.0 | 7.0 | 6.2 | 8.4 | 8.5 | 4.1 | 2.8 | 4.8 | 5.0 | 4.2 | 5.7 | 7.1 | 5.5 | 2.9 | 1.7 | 2.1 | 2.1 | 2.2 | 3.8 | 6.4 | 8.9 | 6.7 | 6.8 | 5.6 | 4.5 | 6.5 | 6.4 | 4.8 | 4.7 |
| 4.7 | 7.5 | 7.2 | 5.0 | 5.2 | 6.2 | 7.7 | 6.4 | 7.5 | 8.3 | 6.2 | 5.4 | 4.7 | 4.5 | 4.9 | 3.7 | 4.5 | 8.1 | 6.5 | 5.0 | 3.7 | 4.3 | 3.0 | 3.1 | 4.9 | 8.3 | 9.3 | 7.1 | 8.0 | 6.4 | 6.4 | 4.7 | 5.5 | 6.3 | 5.2 | 4.5 |
| 7.2 | 8.5 | 9.0 | 10.0 | 9.9 | 10.2 | 8.6 | 10.0 | 8.0 | 6.9 | 10.6 | 10.4 | 9.4 | 8.5 | 7.5 | 8.6 | 10.1 | 10.4 | 11.4 | 10.8 | 9.6 | 7.0 | 4.0 | 4.5 | 6.9 | 8.0 | 7.2 | 6.9 | 7.9 | 7.8 | 7.4 | 9.2 | 9.8 | 9.7 | 9.6 | 8.0 |
| 9.2 | 7.5 | 5.4 | 2.6 | 2.3 | 1.7 | 1.5 | 1.3 | 1.3 | 2.3 | 8.2 | 10.7 | 8.5 | 7.4 | 7.3 | 5.3 | 3.1 | 3.6 | 5.0 | 8.4 | 8.0 | 4.8 | 3.9 | 3.8 | 5.5 | 6.2 | 8.3 | 7.5 | 6.8 | 6.1 | 4.8 | 7.5 | 8.5 | 10.1 | 11.7 | 7.7 |
| 8.6 | 7.1 | 7.1 | 6.8 | 4.5 | 1.9 | .9 | 1.1 | 1.1 | 1.3 | 5.3 | 7.8 | 5.4 | 3.9 | 6.1 | 4.8 | 1.8 | 1.5 | 1.2 | 1.9 | 2.1 | 1.4 | 1.9 | 4.6 | 5.4 | 5.6 | 6.0 | 5.4 | 4.1 | 2.1 | 1.4 | 1.7 | 2.5 | 7.7 | 9.1 | 9.9 |
| 5.7 | 4.7 | 6.0 | 7.8 | 9.2 | 8.9 | 7.3 | 4.0 | 4.7 | 3.6 | 5.1 | 6.4 | 10.9 | 7.7 | 6.1 | 7.8 | 4.6 | 2.1 | 2.1 | 2.6 | 4.6 | 3.0 | 2.1 | 5.4 | 4.6 | 3.0 | 3.9 | 3.8 | 5.3 | 6.6 | 5.4 | 3.5 | 3.4 | 3.9 | 4.2 | 5.3 |
| 6.4 | 6.6 | 6.7 | 7.7 | 7.8 | 8.6 | 8.6 | 7.5 | 6.4 | 5.7 | 6.9 | 8.9 | 10.7 | 8.1 | 6.9 | 7.3 | 6.5 | 6.2 | 4.7 | 5.0 | 6.6 | 7.1 | 4.7 | 3.7 | 3.7 | 3.3 | 3.4 | 4.2 | 5.6 | 6.7 | 6.0 | 5.8 | 4.8 | 4.9 | 5.3 | 5.5 |
| 5.1 | 4.7 | 5.8 | 6.4 | 6.9 | 6.6 | 6.6 | 6.4 | 5.0 | 5.4 | 6.4 | 7.2 | 7.3 | 7.0 | 6.5 | 6.8 | 6.7 | 6.0 | 5.3 | 5.4 | 5.8 | 6.2 | 6.3 | 5.9 | 4.9 | 5.1 | 5.0 | 5.5 | 6.2 | 6.2 | 5.6 | 5.0 | 5.3 | 4.9 | 6.0 | 5.4 |
| 4.1 | 4.8 | 5.3 | 5.1 | 5.7 | 4.9 | 4.6 | 4.7 | 4.0 | 3.7 | 4.1 | 4.5 | 4.3 | 4.0 | 4.0 | 4.3 | 4.3 | 4.4 | 4.4 | 4.5 | 4.9 | 4.9 | 5.0 | 4.8 | 4.2 | 3.8 | 3.6 | 4.4 | 5.3 | 5.4 | 5.3 | 5.1 | 4.8 | 4.6 | 4.2 | 4.0 |
| 3.9 | 4.7 | 4.8 | 4.9 | 5.0 | 4.6 | 4.3 | 4.3 | 3.8 | 3.4 | 3.2 | 3.8 | 3.3 | 2.5 | 3.1 | 3.5 | 4.3 | 4.0 | 3.7 | 3.8 | 4.7 | 4.7 | 4.5 | 4.2 | 3.6 | 3.1 | 3.2 | 3.8 | 4.5 | 5.2 | 5.2 | 4.5 | 4.1 | 3.4 | 3.1 | 3.5 |
| 2.9 | 3.3 | 3.9 | 5.0 | 5.1 | 5.3 | 5.1 | 4.4 | 4.1 | 4.1 | 4.0 | 4.2 | 3.5 | 3.3 | 2.9 | 2.9 | 3.4 | 3.5 | 3.7 | 3.9 | 4.3 | 3.6 | 2.3 | 1.4 | 1.4 | 1.8 | 1.7 | 1.5 | 1.5 | 1.4 | 1.1 | .9 | 1.2 | 2.1 | 3.4 | 3.0 |
| 2.7 | 3.2 | 4.1 | 4.4 | 4.7 | 4.5 | 3.9 | 3.0 | 2.9 | 2.4 | 2.3 | 2.1 | 2.1 | 1.9 | 1.6 | 1.2 | 1.0 | 1.5 | 1.6 | 1.9 | 1.9 | 1.9 | 1.9 | 1.6 | 1.3 | 1.1 | .9 | .9 | .8 | .9 | 1.1 | 1.3 | 1.7 | 2.3 | 2.8 | 2.6 |

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002

Channel: AMSUA-7 (300 hPa)

NOAA16, using all observations



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .4 | .4 | .4 | .4 | .4 | .4 | .4 | .6 | .4 | .5 | .6 | .5 | 1.0 | 1.5 | 1.4 | .7 | .4 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .4 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | .4 |
| .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .5 | .6 | .9 | 1.7 | 2.1 | 2.4 | 1.5 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .5 | .5 | .5 | .6 | .5 | .4 | .5 | .5 | .5 | .5 | .4 | .3 | .3 |
| .4 | .5 | .6 | .7 | .6 | .6 | .5 | .5 | .4 | .4 | .4 | .6 | .5 | 1.6 | 1.4 | .6 | .8 | .4 | .5 | .5 | .4 | .5 | .4 | .4 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | .6 | .7 | .6 | .6 | .5 |
| .4 | .4 | .5 | .4 | .5 | .6 | .5 | .5 | .5 | .4 | .5 | .5 | .5 | .4 | .4 | .4 | .4 | .5 | .5 | .5 | .5 | .4 | .5 | .5 | .4 | .5 | .5 | .6 | .7 | .6 | .5 | .5 | .5 | .4 | .5 | .4 |
| .4 | .4 | .3 | .3 | .3 | .6 | .8 | .7 | .7 | .6 | .5 | .5 | .4 | .4 | .4 | .3 | .3 | .6 | .5 | .6 | .7 | .7 | .7 | .6 | .7 | .9 | 1.0 | 1.0 | .9 | .8 | .5 | .5 | .5 | .3 | .3 | .3 |
| .4 | .3 | .3 | .3 | .2 | .3 | .9 | 1.0 | 1.1 | .8 | .6 | .4 | .3 | .3 | .2 | .3 | .3 | .8 | .8 | .5 | .6 | .8 | 1.0 | 1.0 | 1.1 | 1.7 | 2.3 | 2.4 | 1.2 | .8 | .6 | .5 | .4 | .4 | .4 | .3 |
| .3 | .3 | .4 | .3 | .3 | .2 | .5 | .9 | .7 | .6 | .5 | .4 | .2 | .2 | .3 | .3 | .5 | .9 | .7 | .9 | 1.0 | .8 | .8 | .9 | .8 | .7 | 1.7 | 1.6 | 1.0 | .6 | .4 | .3 | .4 | .3 | .3 | .2 |
| .4 | .5 | .5 | .3 | .3 | .3 | .4 | .5 | .7 | .7 | .5 | .4 | .3 | .3 | .3 | .3 | .7 | 1.1 | .7 | 1.0 | .8 | 1.1 | .9 | .5 | .3 | .7 | 1.0 | .7 | .7 | .4 | .6 | .3 | .3 | .4 | .4 | .3 |
| .5 | .6 | .5 | .6 | .6 | .6 | .5 | .6 | .5 | .5 | 1.0 | .9 | .7 | .5 | .5 | .6 | .7 | .8 | 1.1 | 1.2 | 1.0 | 1.1 | .7 | .3 | .4 | .6 | .4 | .6 | .6 | .6 | .5 | .5 | .6 | .6 | .6 | .5 |
| .6 | .5 | .4 | .3 | .3 | .2 | .2 | .2 | .3 | .3 | 1.0 | .9 | .7 | .7 | .5 | .3 | .3 | .3 | .4 | 1.0 | .9 | .8 | .4 | .2 | .4 | .3 | .5 | .5 | .6 | .6 | .5 | .8 | .7 | .6 | .7 | .5 |
| .6 | .4 | .5 | .5 | .3 | .3 | .3 | .3 | .2 | .3 | 1.2 | 1.4 | .5 | .5 | .5 | .3 | .3 | .2 | .3 | .8 | .7 | .7 | .4 | .4 | .4 | .5 | .4 | .4 | .3 | .2 | .6 | .6 | .4 | .5 | .6 | .7 |
| .4 | .3 | .4 | .5 | .5 | .5 | .4 | .3 | .4 | .3 | .4 | 1.2 | 1.2 | .6 | .5 | .5 | .3 | .3 | .3 | .7 | .8 | .6 | .4 | .3 | .3 | .3 | .3 | .3 | .4 | .7 | .9 | .6 | .4 | .4 | .3 | .3 |
| .4 | .4 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .6 | .7 | .9 | .4 | .4 | .4 | .4 | .4 | .3 | .4 | .6 | .5 | .4 | .3 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .5 | .5 | .4 | .3 | .5 |
| .4 | .3 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .6 | .5 | .4 | .4 | .4 | .4 | .4 | .5 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .3 | .3 | .4 | .4 | .4 | .5 |
| .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .4 | .4 | .5 | .5 | .4 | .4 | .5 | .5 | .4 | .4 | .5 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .5 | .5 | .5 |
| .5 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | .5 | 1.0 | .7 | .5 | .5 | .5 | .6 | .5 | .5 | .5 | .5 | .6 | .7 | .9 | .7 | .7 | .7 | .8 | .9 | .9 | .9 | .9 | .7 | .7 | .6 | .5 |
| .7 | .6 | .7 | .9 | 1.3 | 1.5 | 1.4 | 1.5 | 1.5 | 1.3 | 1.2 | 1.3 | .7 | .7 | .9 | 1.0 | 1.2 | 1.6 | 2.0 | 2.1 | 2.2 | 2.1 | 2.0 | 1.5 | 1.3 | 1.5 | 1.8 | 2.0 | 1.8 | 2.1 | 1.9 | 1.5 | 1.1 | 1.4 | 1.3 | .7 |
| .9 | .9 | 1.3 | 1.2 | 1.2 | 1.1 | 1.4 | 1.7 | 1.7 | .8 | .7 | .8 | 1.0 | 1.1 | .9 | 1.1 | 1.1 | 1.4 | 1.4 | 1.6 | 1.6 | 1.6 | 2.0 | 2.2 | 2.3 | 2.3 | 2.2 | 1.9 | 1.9 | 1.8 | 1.6 | 1.5 | 1.5 | 1.7 | 1.3 | .9 |

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

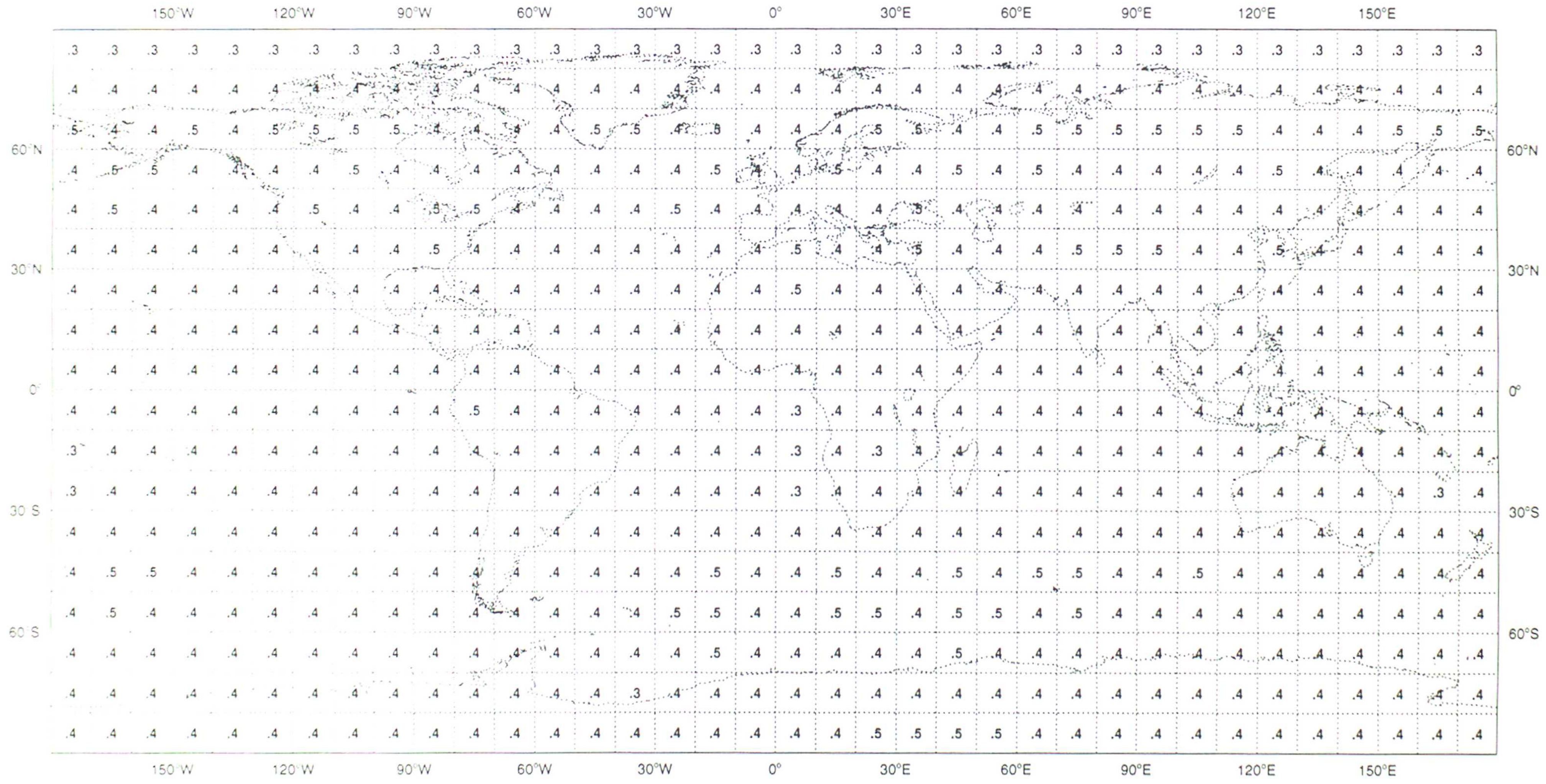
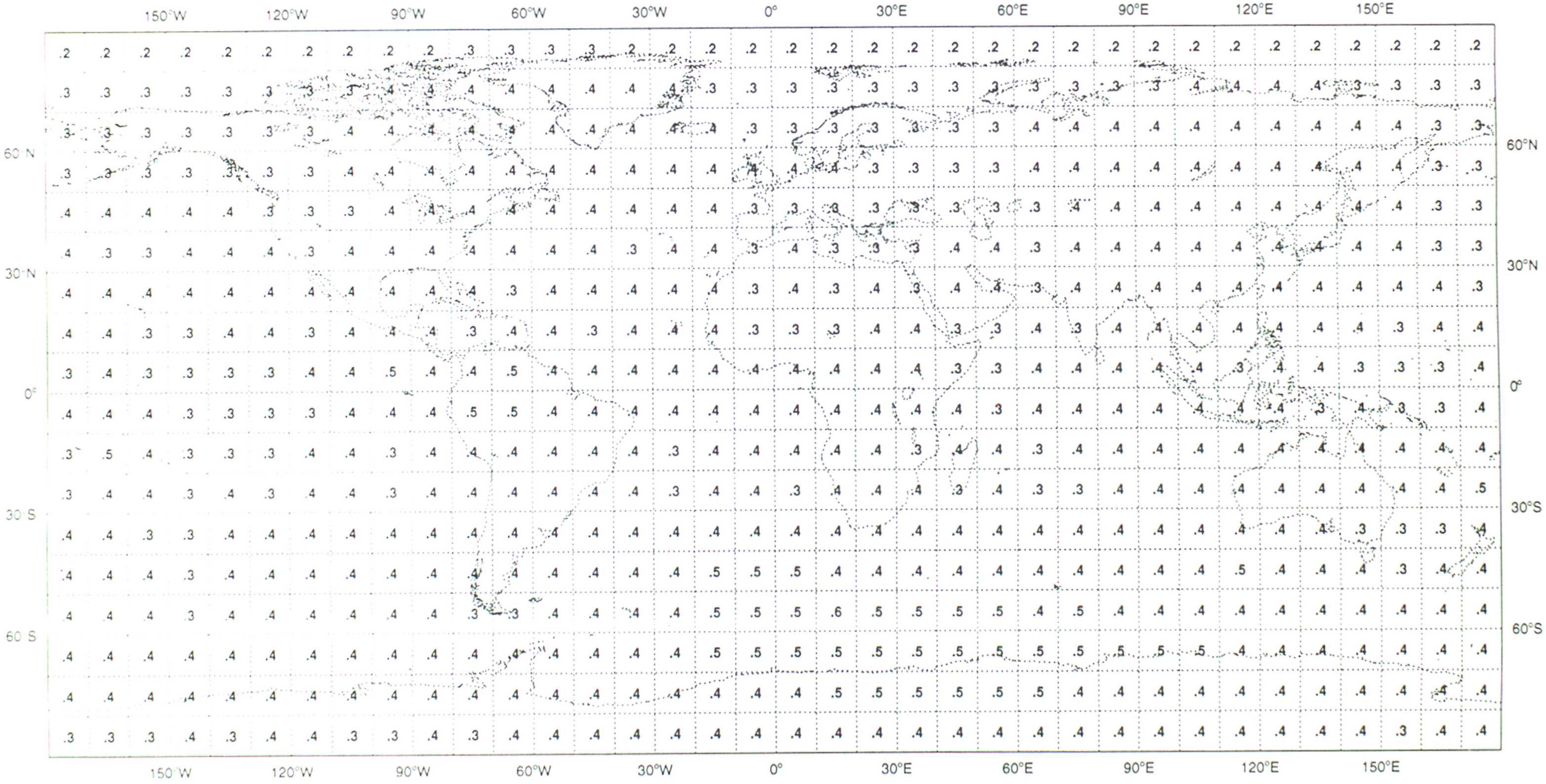

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). MAY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .3 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .3 .4 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.4 .4 .3 .3 .4 .4 .3 .4 .4 .4 .3 .4 .4 .3 .4 .4 .4 .3 .3 .3 .4 .4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4
.3 .4 .3 .3 .3 .3 .4 .4 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .4
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.3 .5 .4 .3 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
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.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.3 .3 .3 .4 .3 .4 .4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4

## TABLE 8

## MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
## DATA TYPE:- DRIFTER
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**
**Period** :One calendar month.

**Data monitored** :Reports from each unique identifier for drifting buoy.

**Area monitored** :10°N - 80°N, 85°W - 0°W

**Standard of comparison** :Background field from UKMO global model.

**Position** :Average latitude and longitude for period.

**Observation times** :All hours combined.

**Elements monitored** :Mean sea-level pressure (hPa)
:Wind speed (m $s^{-1}$)
:Wind direction (degrees)

**Parameters monitored**

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
**N.B. A positive bias indicates the wind observation is veered to the background**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

**GROSS ERROR LIMITS** :15 hPa (pressure)
:25 m $s^{-1}$ (Vector Wind)

**N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m $s^{-1}$**

| IDENTIFIER | LAT. | LONG. | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | |
| 12512 | 41.2 | -17.0 | P | 1 | 0 | 0 | 0.0 | -0.8 | 0.8 |
| 12696 | 53.5 | -19.2 | P | 1 | 0 | 0 | 0.0 | -0.5 | 0.5 |
| 13503 | 22.8 | -26.4 | P | 127 | 0 | 2 | 0.5 | -0.1 | 0.5 |
| 25552 | 73.2 | -19.7 | P | 346 | 0 | 36 | 1.4 | 0.6 | 1.5 |
| 32512 | 40.0 | -16.3 | P | 1 | 0 | 0 | 0.0 | -0.2 | 0.2 |
| 41501 | 18.1 | -54.9 | P | 136 | 0 | 15 | 1.4 | 2.0 | 2.4 |
| 41503 | 20.2 | -40.5 | P | 339 | 0 | 1 | 0.6 | -0.4 | 0.7 |
| 41522 | 15.6 | -40.3 | P | 314 | 0 | 0 | 0.5 | 0.3 | 0.6 |
| 41523 | 28.5 | -42.8 | P | 384 | 0 | 38 | 0.5 | 0.2 | 0.5 |
| 41528 | 12.0 | -53.0 | P | 110 | 0 | 0 | 0.5 | 0.2 | 0.5 |
| 41552 | 21.3 | -53.4 | P | 536 | 0 | 0 | 0.5 | -1.0 | 1.1 |
| 41556 | 16.0 | -76.6 | P | 622 | 0 | 0 | 0.5 | -0.8 | 0.9 |
| 41557 | 21.0 | -70.8 | P | 587 | 0 | 0 | 0.6 | -0.2 | 0.6 |
| 41559 | 21.9 | -70.1 | P | 617 | 0 | 0 | 0.5 | -0.5 | 0.7 |
| 41560 | 16.3 | -61.7 | P | 489 | 0 | 0 | 0.6 | -1.0 | 1.1 |
| 41561 | 20.5 | -54.5 | P | 595 | 0 | 0 | 0.5 | -0.7 | 0.8 |
| 41563 | 20.2 | -51.9 | P | 634 | 0 | 1 | 0.6 | -0.4 | 0.7 |
| 41577 | 36.7 | -75.1 | P | 660 | 0 | 65 | 0.6 | -0.3 | 0.6 |
| 41579 | 39.9 | -70.6 | P | 658 | 1 | 65 | 0.5 | 0.8 | 1.0 |
| 41580 | 40.1 | -70.5 | P | 724 | 0 | 67 | 0.5 | -0.2 | 0.6 |
| 41625 | 23.4 | -49.0 | P | 141 | 1 | 66 | 0.5 | 0.4 | 0.7 |
| 41630 | 29.4 | -80.3 | P | 522 | 0 | 59 | 0.6 | 0.2 | 0.7 |
| 41640 | 29.1 | -80.4 | P | 475 | 0 | 56 | 0.6 | 0.7 | 1.0 |
| 41641 | 29.6 | -80.6 | P | 621 | 0 | 62 | 0.6 | 0.3 | 0.7 |
| 41643 | 31.7 | -80.2 | P | 632 | 0 | 63 | 0.6 | -0.1 | 0.7 |
| 41645 | 29.4 | -77.7 | P | 610 | 0 | 1 | 0.7 | 0.1 | 0.7 |
| 41647 | 30.7 | -70.8 | P | 613 | 0 | 0 | 0.6 | -0.1 | 0.6 |
| 41648 | 24.4 | -71.1 | P | 615 | 0 | 1 | 0.5 | 0.3 | 0.6 |
| 41649 | 10.6 | -40.9 | P | 287 | 0 | 0 | 0.9 | 0.4 | 1.0 |
| 41650 | 30.2 | -65.0 | P | 620 | 0 | 1 | 0.6 | 0.3 | 0.7 |
| 41651 | 24.3 | -75.4 | P | 122 | 0 | 1 | 0.5 | 0.3 | 0.5 |
| 41652 | 27.6 | -66.6 | P | 621 | 0 | 1 | 0.6 | -0.1 | 0.6 |
| 41656 | 32.1 | -80.8 | P | 784 | 0 | 18 | 0.6 | 0.1 | 0.7 |
| 41657 | 40.8 | -36.0 | P | 430 | 0 | 1 | 0.9 | -0.6 | 1.1 |
| 41658 | 34.9 | -45.2 | P | 631 | 0 | 1 | 0.5 | -0.7 | 0.9 |
| 41659 | 38.0 | -33.1 | P | 650 | 0 | 1 | 0.6 | 0.8 | 1.0 |
| 41665 | 32.2 | -79.0 | P | 565 | 0 | 61 | 0.7 | 0.8 | 1.1 |
| 41666 | 34.0 | -77.1 | P | 652 | 0 | 64 | 0.6 | 0.2 | 0.7 |
| 42533 | 40.4 | -58.8 | P | 620 | 0 | 0 | 0.7 | -0.8 | 1.1 |
| 44504 | 44.2 | -49.2 | P | 196 | 0 | 2 | 0.8 | -0.3 | 0.8 |
| 44505 | 48.6 | -49.4 | P | 57 | 88 | 89 | 0.4 | -0.6 | 0.7 |
| 44517 | 39.6 | -62.9 | P | 390 | 6 | 99 | 3.5 | -0.7 | 3.6 |
| 44549 | 55.2 | -24.3 | P | 1233 | 0 | 46 | 1.1 | -0.4 | 1.2 |
| 44550 | 54.4 | -20.1 | P | 1242 | 0 | 45 | 0.8 | -0.3 | 0.9 |
| 44587 | 40.8 | -57.9 | P | 1 | 0 | 0 | 0.0 | -0.7 | 0.7 |
| 44601 | 39.6 | -54.5 | P | 511 | 1 | 2 | 0.7 | 0.0 | 0.7 |
| 44602 | 42.3 | -56.8 | P | 510 | 1 | 2 | 0.7 | 0.0 | 0.7 |
| 44612 | 26.3 | -39.4 | P | 667 | 0 | 1 | 0.4 | -0.4 | 0.5 |
| 44614 | 43.9 | -22.4 | P | 1 | 0 | 0 | 0.0 | -2.0 | 2.0 |
| 44615 | 42.4 | -24.5 | P | 1 | 100 | 100 | | | |
| 44616 | 40.5 | -16.8 | P | 662 | 0 | 3 | 0.7 | 0.0 | 0.7 |
| 44621 | 63.3 | -36.6 | P | 1587 | 0 | 57 | 2.1 | -0.2 | 2.2 |
| 44624 | 44.2 | -23.5 | P | 648 | 0 | 2 | 0.8 | 0.2 | 0.8 |
| 44625 | 42.2 | -23.7 | P | 693 | 0 | 6 | 0.8 | 0.1 | 0.8 |
| 44627 | 42.7 | -28.2 | P | 600 | 0 | 3 | 1.3 | -0.3 | 1.3 |
| 44721 | 28.3 | -33.3 | P | 717 | 0 | 7 | 0.4 | -0.2 | 0.5 |
| 44723 | 44.3 | -35.3 | P | 663 | 0 | 2 | 1.2 | 0.5 | 1.3 |
| 44726 | 62.5 | -35.2 | P | 1657 | 0 | 58 | 0.9 | 0.0 | 0.9 |
| 44728 | 52.0 | -31.6 | P | 1535 | 0 | 57 | 0.7 | -0.8 | 1.1 |
| 44730 | 56.4 | -25.6 | P | 1324 | 0 | 48 | 0.8 | -0.2 | 0.8 |

| IDENTIFIER | LAT. | LONG. | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| MEAN SEA LEVEL PRESSURE | | | | | | | | | |
| 44739 | 44.3 | -57.4 | P | 1 | 0 | 0 | 0.0 | -1.0 | 1.0 |
| 44742 | 59.5 | -16.3 | P | 1408 | 0 | 51 | 0.6 | -0.2 | 0.6 |
| 44743 | 61.6 | -22.0 | P | 1185 | 0 | 64 | 0.9 | -0.2 | 0.9 |
| 44763 | 46.9 | -33.8 | P | 661 | 0 | 2 | 1.4 | -0.1 | 1.4 |
| 44764 | 52.1 | -35.2 | P | 667 | 0 | 2 | 0.9 | -0.7 | 1.1 |
| 44767 | 51.2 | -44.7 | P | 682 | 0 | 11 | 1.0 | -0.3 | 1.0 |
| 44768 | 47.4 | -49.4 | P | 626 | 0 | 2 | 0.8 | -0.1 | 0.8 |
| 44769 | 56.1 | -41.4 | P | 220 | 0 | 2 | 0.8 | -0.3 | 0.9 |
| 44770 | 53.2 | -44.7 | P | 215 | 0 | 1 | 0.8 | -0.5 | 1.0 |
| 44772 | 57.5 | -37.5 | P | 210 | 0 | 2 | 1.3 | -0.3 | 1.3 |
| 44773 | 45.6 | -40.4 | P | 84 | 0 | 4 | 1.3 | -0.4 | 1.4 |
| 44775 | 29.2 | -38.0 | P | 684 | 0 | 1 | 0.4 | -0.7 | 0.8 |
| 44778 | 48.4 | -8.4 | P | 953 | 0 | 34 | 0.7 | -0.3 | 0.7 |
| 44779 | 54.9 | -20.3 | P | 429 | 0 | 39 | 0.7 | -0.3 | 0.7 |
| 44780 | 54.1 | -36.4 | P | 493 | 0 | 33 | 0.7 | -0.4 | 0.8 |
| 44807 | 43.5 | -70.1 | P | 1 | 0 | 0 | 0.0 | 0.3 | 0.3 |
| 44808 | 40.5 | -69.4 | P | 1 | 0 | 0 | 0.0 | -0.6 | 0.6 |
| 44813 | 42.4 | -70.7 | P | 1 | 0 | 0 | 0.0 | -1.8 | 1.8 |
| 45512 | 43.6 | -77.4 | P | 1 | 0 | 0 | 0.0 | 0.3 | 0.3 |
| 45802 | 45.3 | -75.5 | P | 2 | 0 | 0 | 2.0 | -1.5 | 2.5 |
| 45803 | 45.4 | -82.8 | P | 2 | 0 | 0 | 0.8 | 0.6 | 1.0 |
| 45812 | 43.6 | -78.0 | P | 2 | 0 | 0 | 0.1 | 1.8 | 1.8 |
| 45847 | 42.4 | -82.7 | P | 1 | 0 | 0 | 0.0 | 2.5 | 2.5 |
| 47556 | 61.5 | -67.9 | P | 351 | 0 | 23 | 1.0 | 0.2 | 1.0 |
| 47699 | 37.0 | -32.0 | P | 1 | 0 | 0 | 0.0 | 0.4 | 0.4 |
| 52696 | 54.2 | -21.4 | P | 1 | 0 | 0 | 0.0 | -0.6 | 0.6 |
| 62501 | 31.8 | -30.5 | P | 659 | 0 | 1 | 0.5 | 0.2 | 0.5 |
| 62503 | 28.8 | -24.1 | P | 694 | 0 | 3 | 0.5 | -0.7 | 0.8 |
| 62504 | 36.9 | -17.7 | P | 705 | 0 | 12 | 0.6 | 0.1 | 0.6 |
| 62512 | 40.8 | -16.8 | P | 916 | 0 | 29 | 0.9 | -0.7 | 1.2 |
| 62518 | 33.6 | -16.5 | P | 688 | 0 | 26 | 0.5 | -0.4 | 0.6 |
| 62520 | 62.4 | -7.0 | P | 98 | 0 | 0 | 1.0 | -0.4 | 1.1 |
| 62572 | 41.8 | -17.7 | P | 1 | 0 | 0 | 0.0 | -0.9 | 0.9 |
| 62588 | 33.2 | -17.0 | P | 1 | 0 | 0 | 0.0 | -0.8 | 0.8 |
| 62591 | 53.5 | -5.4 | P | 1 | 0 | 0 | 0.0 | -0.1 | 0.1 |
| 62598 | 62.4 | -6.5 | P | 129 | 0 | 44 | 0.9 | -0.6 | 1.1 |
| 62606 | 57.0 | -9.9 | P | 2 | 0 | 0 | 1.1 | -1.4 | 1.8 |
| 62656 | 53.5 | -18.6 | P | 2 | 0 | 0 | 0.3 | -0.8 | 0.9 |
| 62694 | 55.6 | -22.2 | P | 1407 | 0 | 52 | 0.8 | -0.2 | 0.9 |
| 62696 | 53.8 | -20.2 | P | 1224 | 0 | 45 | 0.9 | -0.5 | 1.0 |
| 62697 | 52.3 | -17.4 | P | 1143 | 0 | 42 | 1.3 | -0.4 | 1.4 |
| 62711 | 58.4 | -33.3 | P | 611 | 0 | 1 | 0.9 | 0.0 | 0.9 |
| 62823 | 51.4 | -7.9 | P | 1 | 0 | 0 | 0.0 | -1.4 | 1.4 |
| 62863 | 47.5 | -8.4 | P | 1 | 0 | 0 | 0.0 | 0.2 | 0.2 |
| 62881 | 51.0 | -13.3 | P | 1 | 0 | 0 | 0.0 | -0.7 | 0.7 |
| 63662 | 74.0 | -17.3 | P | 347 | 1 | 3 | 0.9 | 0.0 | 0.9 |
| 63663 | 67.2 | -31.1 | P | 266 | 0 | 2 | 1.1 | 0.1 | 1.1 |
| 64549 | 57.0 | -19.4 | P | 831 | 1 | 62 | 1.6 | -0.2 | 1.6 |
| 64553 | 57.9 | -28.1 | P | 698 | 0 | 44 | 0.7 | -0.5 | 0.9 |
| 64560 | 60.6 | -29.4 | P | 462 | 12 | 41 | 5.0 | -3.2 | 5.9 |
| 64845 | 59.1 | -11.4 | P | 1 | 0 | 0 | 0.0 | -1.4 | 1.4 |
| 64953 | 57.4 | -28.2 | P | 1 | 0 | 0 | 0.0 | 0.7 | 0.7 |
| WIND SPEED | | | | | | | | | |
| 13503 | 22.8 | -26.4 | SPEED | 5 | 0 | 100 | 0.7 | 10.6 | 10.6 |
| 266294 | 50.2 | -5.5 | SPEED | 1 | 0 | 100 | 0.0 | 2.7 | 2.7 |
| 41501 | 18.1 | -54.9 | SPEED | 7 | 0 | 100 | 0.2 | 11.6 | 11.6 |
| 41503 | 20.2 | -40.5 | SPEED | 337 | 0 | 100 | 1.1 | -1.1 | 1.5 |
| 41522 | 15.6 | -40.3 | SPEED | 314 | 0 | 100 | 1.4 | 0.4 | 1.4 |

| IDENTIFIER | LAT. | LONG. | ELEM | NOBS | PGE | %REJ | SD | BIAS | RMS |
|---|---|---|---|---|---|---|---|---|---|
| WIND SPEED | | | | | | | | | |
| 41523 | 28.5 | -42.8 | SPEED | 259 | 0 | 100 | 1.2 | -4.9 | 5.1 |
| 41528 | 12.0 | -53.0 | SPEED | 1 | 0 | 100 | 0.0 | 17.5 | 17.5 |
| 41552 | 21.3 | -53.4 | SPEED | 476 | 0 | 100 | 1.3 | -0.5 | 1.4 |
| 41556 | 16.0 | -76.6 | SPEED | 612 | 0 | 100 | 2.5 | 1.4 | 2.9 |
| 41557 | 21.0 | -70.8 | SPEED | 347 | 63 | 100 | 6.7 | 14.2 | 15.7 |
| 41559 | 21.9 | -70.1 | SPEED | 605 | 0 | 100 | 2.1 | 0.8 | 2.3 |
| 41561 | 20.5 | -54.5 | SPEED | 588 | 0 | 100 | 1.2 | -0.2 | 1.2 |
| 41563 | 20.2 | -51.9 | SPEED | 628 | 0 | 100 | 1.2 | 0.0 | 1.2 |
| 41577 | 36.7 | -75.1 | SPEED | 1 | 0 | 100 | 0.0 | 4.7 | 4.7 |
| 41625 | 23.4 | -49.0 | SPEED | 12 | 0 | 100 | 3.3 | 12.0 | 12.5 |
| 41645 | 29.4 | -77.7 | SPEED | 607 | 0 | 100 | 3.5 | -3.4 | 4.9 |
| 41647 | 30.7 | -70.8 | SPEED | 609 | 0 | 100 | 2.1 | 0.7 | 2.2 |
| 41648 | 24.4 | -71.1 | SPEED | 615 | 1 | 100 | 2.0 | 0.8 | 2.2 |
| 41649 | 10.6 | -40.9 | SPEED | 285 | 0 | 100 | 1.4 | -0.1 | 1.4 |
| 41652 | 27.6 | -66.6 | SPEED | 616 | 3 | 100 | 4.9 | 1.7 | 5.2 |
| 42533 | 40.4 | -58.8 | SPEED | 297 | 22 | 100 | 9.7 | 4.3 | 10.6 |
| 43618 | 60.3 | -4.1 | SPEED | 1 | 0 | 100 | 0.0 | 1.3 | 1.3 |
| 44601 | 39.6 | -54.5 | SPEED | 507 | 1 | 100 | 3.3 | 1.2 | 3.5 |
| 44602 | 42.3 | -56.8 | SPEED | 509 | 1 | 100 | 3.6 | 1.0 | 3.7 |
| 44739 | 44.3 | -57.4 | SPEED | 1 | 0 | 100 | 0.0 | 0.5 | 0.5 |
| 44768 | 47.4 | -49.4 | SPEED | 1 | 100 | 0 | | | |
| 44808 | 40.5 | -69.4 | SPEED | 1 | 0 | 100 | 0.0 | -1.0 | 1.0 |
| 62520 | 62.4 | -7.0 | SPEED | 77 | 0 | 100 | 4.1 | 1.8 | 4.5 |
| 62606 | 57.0 | -9.9 | SPEED | 1 | 0 | 100 | 0.0 | -1.0 | 1.0 |
| 62705 | 55.0 | -12.7 | SPEED | 1 | 0 | 100 | 0.0 | 0.2 | 0.2 |
| 62711 | 58.4 | -33.3 | SPEED | 607 | 0 | 100 | 1.9 | 1.2 | 2.2 |
| 62823 | 51.4 | -7.9 | SPEED | 2 | 0 | 100 | 1.7 | 0.3 | 1.7 |
| 62863 | 47.5 | -8.4 | SPEED | 1 | 0 | 100 | 0.0 | -1.5 | 1.5 |
| 62881 | 51.0 | -13.3 | SPEED | 1 | 0 | 100 | 0.0 | 1.7 | 1.7 |
| 64553 | 57.9 | -28.1 | SPEED | 1 | 100 | 0 | | | |
| 64845 | 59.1 | -11.4 | SPEED | 1 | 0 | 100 | 0.0 | 1.5 | 1.5 |
| WIND DIRECTION | | | | | | | | | |
| 13503 | 22.8 | -26.4 | DIRN. | 2 | 0 | 0 | 2.6 | 24.7 | 24.9 |
| 266294 | 50.2 | -5.5 | DIRN. | 1 | 0 | 0 | 0.0 | -43.2 | 43.2 |
| 41501 | 18.1 | -54.9 | DIRN. | 7 | 0 | 0 | 12.1 | 32.2 | 34.4 |
| 41503 | 20.2 | -40.5 | DIRN. | 245 | 0 | 0 | 11.8 | 15.4 | 19.4 |
| 41522 | 15.6 | -40.3 | DIRN. | 313 | 0 | 0 | 9.3 | -8.9 | 12.9 |
| 41528 | 12.0 | -53.0 | DIRN. | 1 | 0 | 0 | 0.0 | 23.0 | 23.0 |
| 41552 | 21.3 | -53.4 | DIRN. | 414 | 0 | 0 | 11.3 | -2.3 | 11.5 |
| 41556 | 16.0 | -76.6 | DIRN. | 551 | 0 | 0 | 18.4 | -1.9 | 18.5 |
| 41557 | 21.0 | -70.8 | DIRN. | 347 | 63 | 0 | 10.8 | -0.4 | 10.8 |
| 41559 | 21.9 | -70.1 | DIRN. | 527 | 0 | 0 | 16.0 | 7.5 | 17.6 |
| 41561 | 20.5 | -54.5 | DIRN. | 529 | 0 | 0 | 15.8 | 2.5 | 16.0 |
| 41563 | 20.2 | -51.9 | DIRN. | 584 | 0 | 0 | 11.7 | -0.8 | 11.8 |
| 41577 | 36.7 | -75.1 | DIRN. | 1 | 0 | 0 | 0.0 | -145.2 | 145.2 |
| 41625 | 23.4 | -49.0 | DIRN. | 12 | 0 | 0 | 10.6 | 18.4 | 21.2 |
| 41645 | 29.4 | -77.7 | DIRN. | 47 | 0 | 0 | 26.8 | -0.1 | 26.8 |
| 41647 | 30.7 | -70.8 | DIRN. | 356 | 1 | 0 | 16.9 | -7.7 | 18.6 |
| 41648 | 24.4 | -71.1 | DIRN. | 446 | 1 | 0 | 18.9 | 24.7 | 31.1 |
| 41649 | 10.6 | -40.9 | DIRN. | 283 | 0 | 0 | 10.8 | -11.4 | 15.7 |
| 41652 | 27.6 | -66.6 | DIRN. | 426 | 5 | 0 | 17.7 | -10.9 | 20.8 |
| 42533 | 40.4 | -58.8 | DIRN. | 232 | 28 | 0 | 23.0 | 3.1 | 23.2 |
| 44601 | 39.6 | -54.5 | DIRN. | 414 | 2 | 0 | 18.7 | 5.9 | 19.6 |
| 44602 | 42.3 | -56.8 | DIRN. | 352 | 1 | 0 | 29.7 | -0.1 | 29.7 |
| 44768 | 47.4 | -49.4 | DIRN. | 1 | 100 | 0 | | | |
| 62520 | 62.4 | -7.0 | DIRN. | 40 | 0 | 0 | 26.8 | -0.4 | 26.8 |
| 62711 | 58.4 | -33.3 | DIRN. | 472 | 0 | 0 | 22.6 | 8.7 | 24.2 |
| 62823 | 51.4 | -7.9 | DIRN. | 2 | 0 | 0 | 5.4 | 16.5 | 17.4 |
| 62863 | 47.5 | -8.4 | DIRN. | 1 | 0 | 0 | 0.0 | 5.8 | 5.8 |
| 62881 | 51.0 | -13.3 | DIRN. | 1 | 0 | 0 | 0.0 | -3.0 | 3.0 |
| 64553 | 57.9 | -28.1 | DIRN. | 1 | 100 | 0 | | | |

# TABLE 9

## MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Statistics for each airline carrier. |
| **Area monitored** | | :40°N - 70°N, 60°W - 0°W. |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Observation times** | | :All hours combined. |
| **Level(s) monitored** | | :300.0 - 150.0 hPa |
| **Elements monitored** | | :TEMP in °C ; WIND in m $s^{-1}$ |
| **Parameters monitored** | :N REP. | :Number of observations received excluding duplicates. |
| | :PG | :Percentage of observations with gross errors. |
| | :PR | :Percentage of observations rejected by quality control including rejections from the duplicate check. |
| | :PC | :Percentage of observations with calm winds. |
| | :RMS | :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| | :BIAS | :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind. |
| **GROSS ERROR LIMITS** | :10.0 °C ; 60 m $s^{-1}$ Vector Wind | |
| **SELECTION CRITERIA** | :N REP ≥ 20 | |

**NB :** All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

| | TEMPERATURE | | | | | WIND | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| AAL | 1124 | 4 | 8 | 1.8 | 0.2 | 1017 | 0 | 5 | 0 | 7.2 | 0.9 |
| AAR | 27 | 0 | 4 | 2.0 | 0.4 | 28 | 0 | 4 | 0 | 6.2 | -0.5 |
| ACA | 1545 | 0 | 3 | 1.6 | -0.4 | 1475 | 0 | 3 | 0 | 6.4 | 0.5 |
| AEA | 188 | 3 | 4 | 1.3 | 0.2 | 66 | 0 | 5 | 0 | 8.4 | 0.4 |
| AEL | 287 | 1 | 11 | 1.6 | -0.8 | 245 | 1 | 15 | 0 | 7.4 | 0.4 |
| AFL | 403 | 1 | 2 | 1.6 | 0.6 | 383 | 0 | 4 | 0 | 7.3 | 0.7 |
| AFR | 929 | 0 | 8 | 1.8 | 0.3 | 743 | 0 | 10 | 0 | 6.9 | 1.0 |
| AIS | 88 | 0 | 10 | 1.8 | -0.1 | 76 | 1 | 12 | 0 | 8.2 | 1.0 |
| AJM | 251 | 1 | 5 | 1.4 | -0.6 | 208 | 0 | 6 | 0 | 8.2 | 1.1 |
| AMM | 48 | 2 | 15 | 1.6 | -0.2 | 47 | 0 | 21 | 0 | 12.7 | 2.6 |
| AMX | 209 | 3 | 9 | 2.2 | -0.1 | 136 | 0 | 7 | 0 | 10.5 | 0.2 |
| AZA | 343 | 1 | 6 | 1.9 | 0.2 | 307 | 0 | 7 | 0 | 8.4 | 0.7 |
| BAL | 108 | 0 | 8 | 1.2 | -0.1 | 104 | 0 | 12 | 0 | 5.9 | 0.8 |
| BAW | 589 | 0 | 11 | 1.8 | -0.6 | 585 | 1 | 11 | 0 | 6.9 | 0.8 |
| BWA | 80 | 0 | 5 | 2.0 | 1.0 | 48 | 0 | 2 | 0 | 7.7 | 0.3 |
| CFC | 58 | 0 | 5 | 2.1 | 0.5 | 60 | 0 | 5 | 0 | 6.8 | 2.4 |
| CFG | 442 | 0 | 3 | 1.6 | -0.8 | 394 | 0 | 4 | 0 | 7.5 | 0.7 |
| CGB | 28 | 0 | 0 | 1.6 | -0.6 | 27 | 0 | 4 | 0 | 6.9 | 1.7 |
| CLX | 305 | 1 | 4 | 1.6 | -0.4 | 298 | 0 | 4 | 0 | 7.3 | 0.5 |
| COA | 140 | 1 | 14 | 1.2 | -0.3 | 103 | 1 | 17 | 0 | 8.3 | 0.2 |
| CRL | 294 | 1 | 5 | 1.7 | 0.0 | 213 | 1 | 5 | 0 | 8.0 | 0.0 |
| CUB | 175 | 1 | 2 | 1.7 | 0.4 | 129 | 0 | 4 | 0 | 9.4 | 0.3 |
| DAF | 24 | 0 | 0 | 0.9 | 0.2 | 23 | 0 | 0 | 0 | 3.8 | 0.6 |
| DAL | 1112 | 0 | 16 | 1.5 | -0.7 | 1039 | 0 | 19 | 0 | 8.9 | 0.7 |
| DBR | 37 | 0 | 5 | 2.1 | -0.5 | 37 | 0 | 8 | 0 | 9.2 | 2.1 |
| DCE | 92 | 1 | 11 | 1.6 | 0.1 | 74 | 0 | 11 | 0 | 6.9 | 0.4 |
| DLH | 835 | 1 | 10 | 1.5 | 0.1 | 810 | 0 | 10 | 0 | 6.9 | 1.0 |
| EDW | 49 | 0 | 0 | 1.7 | -0.3 | 47 | 0 | 2 | 0 | 6.7 | 1.6 |
| EIA | 136 | 1 | 9 | 1.3 | 0.2 | 127 | 0 | 100 | 0 | 20.5 | 9.1 |
| ELY | 108 | 1 | 1 | 1.3 | 0.0 | 106 | 0 | 4 | 0 | 6.8 | 1.3 |
| ETH | 34 | 0 | 15 | 1.1 | 0.0 | 34 | 0 | 18 | 0 | 10.4 | -1.2 |
| EWW | 99 | 0 | 5 | 1.7 | 0.0 | 99 | 1 | 7 | 0 | 7.6 | 1.7 |
| FDX | 920 | 1 | 32 | 1.5 | 0.1 | 922 | 1 | 32 | 0 | 7.0 | 1.5 |
| FIN | 267 | 0 | 3 | 1.5 | 0.3 | 250 | 0 | 4 | 0 | 6.6 | 0.3 |
| GAF | 64 | 0 | 2 | 1.6 | -0.7 | 64 | 0 | 3 | 0 | 6.2 | 1.3 |
| GCO | 154 | 0 | 10 | 1.6 | 0.3 | 156 | 1 | 100 | 0 | 15.7 | 4.4 |
| GTI | 104 | 1 | 6 | 2.1 | 0.0 | 104 | 0 | 5 | 0 | 7.7 | 0.1 |
| IBE | 1069 | 0 | 6 | 1.5 | 0.4 | 620 | 0 | 11 | 0 | 8.4 | 0.0 |
| ICE | 983 | 0 | 4 | 1.5 | -0.1 | 917 | 0 | 4 | 0 | 7.0 | 0.8 |
| JMC | 64 | 0 | 8 | 1.6 | -0.1 | 57 | 0 | 7 | 0 | 6.5 | 1.7 |
| KLM | 1272 | 0 | 2 | 1.7 | 0.2 | 1050 | 0 | 2 | 0 | 6.4 | 0.7 |
| LDA | 22 | 0 | 14 | 1.1 | 0.1 | 25 | 0 | 16 | 0 | 7.2 | 0.0 |
| LDI | 315 | 0 | 3 | 1.6 | 0.0 | 242 | 0 | 3 | 0 | 6.2 | 0.6 |
| LIB | 237 | 1 | 10 | 1.5 | 0.7 | 142 | 0 | 8 | 0 | 7.2 | 1.1 |
| LOT | 184 | 1 | 7 | 1.9 | -0.9 | 176 | 0 | 7 | 0 | 7.6 | 0.9 |
| LTU | 512 | 1 | 6 | 1.6 | -0.2 | 428 | 0 | 6 | 0 | 8.3 | 1.3 |
| MON | 48 | 6 | 17 | 1.9 | 0.1 | 37 | 0 | 16 | 0 | 11.0 | 0.6 |
| MPD | 127 | 2 | 5 | 1.5 | -0.5 | 75 | 1 | 4 | 0 | 5.8 | 1.1 |
| MPH | 440 | 0 | 2 | 1.7 | -0.7 | 399 | 1 | 2 | 0 | 6.2 | 0.2 |
| MYT | 231 | 0 | 5 | 1.5 | -0.1 | 202 | 0 | 6 | 0 | 7.4 | 0.4 |
| NCA | 24 | 0 | 0 | 1.3 | 0.5 | 21 | 0 | 0 | 0 | 4.7 | 0.0 |
| NWA | 3651 | 0 | 4 | 1.6 | 0.4 | 3622 | 0 | 4 | 0 | 6.7 | 0.7 |
| PAC | 113 | 1 | 4 | 1.7 | 0.1 | 117 | 1 | 11 | 0 | 10.9 | 0.5 |
| RAM | 113 | 3 | 8 | 1.7 | 0.4 | 67 | 0 | 6 | 0 | 9.8 | 1.2 |
| RCH | 310 | 1 | 100 | 2.6 | 0.1 | 265 | 0 | 100 | 0 | 14.3 | 2.4 |
| RJA | 30 | 0 | 7 | 2.0 | 0.0 | 30 | 3 | 10 | 0 | 9.1 | -0.2 |
| RRR | 104 | 1 | 13 | 2.0 | -0.3 | 98 | 0 | 21 | 0 | 9.4 | 2.0 |
| RZO | 93 | 1 | 100 | 1.8 | 0.3 | 78 | 0 | 6 | 0 | 9.5 | 0.5 |
| SLR | 150 | 0 | 11 | 1.2 | 0.1 | 130 | 0 | 13 | 0 | 7.7 | 0.7 |

|  |  | TEMPERATURE |  |  |  |  |  | WIND |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IDENT. | N.REP. | PG | PR | RMS | BIAS | N.REP. | PG | PR | PC | RMS | BIAS |
| SSV | 23 | 0 | 0 | 1.0 | -0.3 | 21 | 0 | 0 | 0 | 4.2 | 1.6 |
| TAP | 237 | 1 | 5 | 1.6 | -0.3 | 110 | 0 | 7 | 0 | 9.5 | 1.9 |
| THT | 33 | 0 | 0 | 1.1 | 0.0 | 32 | 0 | 0 | 0 | 4.7 | 1.2 |
| TSC | 188 | 1 | 3 | 1.6 | -0.5 | 183 | 0 | 5 | 0 | 6.4 | 1.2 |
| UAL | 401 | 0 | 69 | 1.9 | -1.3 | 397 | 0 | 70 | 0 | 8.1 | 0.0 |
| UPS | 1211 | 1 | 43 | 2.0 | 0.5 | 1168 | 0 | 42 | 0 | 6.5 | 0.5 |
| USA | 128 | 0 | 2 | 1.3 | -0.2 | 103 | 1 | 11 | 0 | 11.9 | -0.7 |
| VIR | 295 | 0 | 3 | 1.4 | 0.1 | 288 | 0 | 5 | 0 | 7.9 | 0.8 |
| WOA | 127 | 0 | 3 | 1.3 | 0.3 | 127 | 1 | 10 | 0 | 8.4 | 1.7 |
| EU | 23602 | 0 | 27 | 1.2 | 0.0 | 23602 | 0 | 27 | 0 | 4.6 | 0.5 |
| KL | 413 | 0 | 12 | 1.2 | 0.5 | 415 | 0 | 11 | 0 | 5.0 | 1.2 |
| LH | 595 | 0 | 15 | 1.4 | 1.0 | 594 | 0 | 15 | 0 | 4.5 | 0.7 |
| TN | 35 | 0 | 3 | 2.6 | 2.1 | 35 | 0 | 0 | 0 | 8.4 | 0.6 |
| N | 323 | 2 | 7 | 2.2 | 0.4 | 327 | 0 | 7 | 0 | 8.2 | 1.0 |
| US ACARS | 52953 | 5 | 47 | 1.2 | 0.1 | 52953 | 0 | 43 | 0 | 5.0 | 0.6 |

# TABLE 10

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

**Period** :One calendar month.

**Data monitored** :Reports from selected radiosonde TEMPs.

**Area monitored** :0°N - 90°N, 100°W - 40°E

**Standard of comparison** :Background field from UKMO global model.

**Position** :Average latitude and longitude for period.

**Observation times** :00, 12 UTC.

**Level monitored** :100 hPa.

**Element monitored** :GEOPOTENTIAL HEIGHT in metres

**Parameters monitored** :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

**GROSS ERROR LIMITS** :Defined in Appendix I.1

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | SD | RMS | BIAS |
|---|---|---|---|---|---|---|---|---|
| DASAPX | 00 | Z | 100 | 15 | 0 | 30.5 | 37.4 | 21.7 |
| DASAPX | 12 | Z | 100 | 16 | 0 | 17.3 | 41.2 | 37.4 |
| DASAP3 | 12 | Z | 100 | 5 | 0 | 6.3 | 23.5 | 22.6 |
| DBBH | 12 | Z | 100 | 3 | 0 | 8.5 | 54.7 | 54.0 |
| DBLK | 12 | Z | 100 | 11 | 0 | 10.6 | 43.2 | 41.9 |
| FNOR | 00 | Z | 100 | 8 | 0 | 20.6 | 21.0 | 3.9 |
| FNOR | 12 | Z | 100 | 8 | 0 | 24.9 | 32.0 | 20.0 |
| FNOU | 00 | Z | 100 | 10 | 0 | 13.8 | 15.0 | 5.9 |
| FNOU | 12 | Z | 100 | 9 | 0 | 18.5 | 19.0 | 4.3 |
| FNPH | 00 | Z | 100 | 7 | 0 | 11.0 | 39.7 | 38.1 |
| FNPH | 12 | Z | 100 | 8 | 0 | 9.8 | 30.0 | 28.4 |
| FNRS | 00 | Z | 100 | 6 | 0 | 19.1 | 19.5 | 4.2 |
| FNRS | 12 | Z | 100 | 4 | 0 | 15.2 | 15.6 | 3.5 |
| LDWR | 00 | Z | 100 | 30 | 0 | 13.0 | 16.6 | 10.3 |
| LDWR | 12 | Z | 100 | 30 | 0 | 9.8 | 9.8 | -0.6 |
| OVYA2 | 00 | Z | 100 | 3 | 0 | 3.6 | 20.3 | 20.0 |
| OVYA2 | 12 | Z | 100 | 3 | 0 | 10.4 | 14.9 | 10.7 |
| OXTS2 | 00 | Z | 100 | 2 | 0 | 15.0 | 15.5 | 4.0 |
| OXTS2 | 12 | Z | 100 | 3 | 0 | 5.4 | 6.4 | 3.3 |
| SWJS | 00 | Z | 100 | 4 | 0 | 4.6 | 36.5 | 36.3 |
| SWJS | 12 | Z | 100 | 3 | 0 | 8.5 | 23.6 | 22.0 |
| V2XO | 00 | Z | 100 | 5 | 0 | 7.2 | 24.9 | 23.8 |
| V2XO | 12 | Z | 100 | 5 | 0 | 14.5 | 31.2 | 27.6 |
| WPKD | 00 | Z | 100 | 7 | 0 | 20.3 | 35.0 | 28.4 |
| WPKD | 12 | Z | 100 | 9 | 0 | 29.1 | 30.4 | 8.9 |
| ZCBP6 | 00 | Z | 100 | 7 | 0 | 46.9 | 54.8 | 28.3 |
| ZCBP6 | 12 | Z | 100 | 8 | 0 | 16.5 | 36.4 | 32.5 |
| 03953 | 00 | Z | 100 | 30 | 0 | 15.9 | 31.8 | 27.6 |
| 03953 | 12 | Z | 100 | 29 | 0 | 12.6 | 38.2 | 36.1 |
| 04018 | 00 | Z | 100 | 30 | 0 | 7.8 | 19.7 | 18.1 |
| 04018 | 12 | Z | 100 | 29 | 0 | 12.2 | 15.9 | 10.3 |
| 04220 | 00 | Z | 100 | 30 | 0 | 8.6 | 13.0 | 9.7 |
| 04220 | 12 | Z | 100 | 31 | 0 | 11.8 | 13.7 | 7.0 |
| 04270 | 00 | Z | 100 | 29 | 0 | 12.7 | 12.7 | -0.4 |
| 04270 | 12 | Z | 100 | 29 | 0 | 11.4 | 12.0 | 3.8 |
| 04339 | 00 | Z | 100 | 30 | 0 | 8.2 | 18.6 | 16.7 |
| 04339 | 12 | Z | 100 | 31 | 0 | 10.7 | 20.4 | 17.3 |
| 04360 | 00 | Z | 100 | 29 | 0 | 11.3 | 13.4 | 7.2 |
| 04360 | 12 | Z | 100 | 31 | 0 | 8.6 | 10.8 | 6.5 |
| 08001 | 00 | Z | 100 | 27 | 0 | 25.8 | 26.4 | -5.6 |
| 08001 | 12 | Z | 100 | 27 | 0 | 25.1 | 26.2 | 7.6 |
| 08508 | 12 | Z | 100 | 29 | 0 | 13.1 | 33.7 | 31.1 |
| 08522 | 00 | Z | 100 | 29 | 0 | 10.9 | 39.2 | 37.7 |
| 08522 | 12 | Z | 100 | 31 | 0 | 10.8 | 33.5 | 31.7 |
| 08594 | 12 | Z | 100 | 11 | 0 | 21.3 | 43.4 | 37.8 |
| 60020 | 00 | Z | 100 | 25 | 0 | 10.3 | 43.8 | 42.6 |
| 60020 | 12 | Z | 100 | 26 | 0 | 10.2 | 37.8 | 36.3 |
| 71600 | 00 | Z | 100 | 29 | 0 | 13.5 | 18.0 | 11.9 |
| 71600 | 12 | Z | 100 | 30 | 0 | 12.6 | 26.2 | 23.0 |
| 72201 | 00 | Z | 100 | 30 | 0 | 23.7 | 63.3 | 58.7 |
| 72201 | 12 | Z | 100 | 31 | 0 | 27.4 | 56.2 | 49.0 |
| 72402 | 00 | Z | 100 | 29 | 0 | 16.9 | 55.7 | 53.0 |
| 72402 | 12 | Z | 100 | 29 | 0 | 13.6 | 66.0 | 64.6 |
| 74494 | 00 | Z | 100 | 26 | 0 | 14.3 | 28.7 | 24.8 |
| 74494 | 12 | Z | 100 | 31 | 0 | 11.5 | 21.9 | 18.6 |
| 78016 | 00 | Z | 100 | 29 | 0 | 15.0 | 39.5 | 36.6 |
| 78016 | 12 | Z | 100 | 29 | 0 | 16.2 | 43.7 | 40.6 |

## TABLE 11

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures:**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :500 hPa. |
| **Element monitored** | | :GEOPOTENTIAL HEIGHT in metres |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :SD | :SD of difference of observations from background values at level shown excluding those with gross errors. |
| | :BIAS | :Mean difference of observations from background values at level shown excluding those with gross errors. |

**GROSS ERROR LIMITS** :Defined in Appendix I.1

```
 WMO   OBS                NUM   NUM
IDENT TIME ELM   LEV   OBS  GROSS      SD      RMS     BIAS

DASAPX 00   Z    500    16     0       7.0      7.9     -3.6
DASAPX 12   Z    500    16     0       4.8      4.9      1.1
DASAP3 12   Z    500     6     0      27.1     31.0    -15.2
DBBH   12   Z    500     3     0       1.7     19.4     19.3
DBLK   12   Z    500    12     0       9.6     14.6     11.0

FNOR   00   Z    500    11     0       5.3      5.5      1.2
FNOR   12   Z    500     9     0       8.0     18.9     17.1
FNOU   00   Z    500    12     0       5.9      7.8     -5.1
FNOU   12   Z    500    10     0       7.8      9.1      4.7
FNPH   00   Z    500    12     0      27.8     28.3      4.9

FNPH   12   Z    500    12     0       6.7     14.1     12.3
FNRS   00   Z    500    12     0      23.4     26.8    -13.0
FNRS   12   Z    500     7     0       5.5      5.5     -0.1
LDWR   00   Z    500    30     0       9.7     12.5      8.0
LDWR   12   Z    500    30     0       8.2      8.3     -1.1

OVYA2  00   Z    500     3     0      10.0     12.8      8.0
OVYA2  12   Z    500     3     0      10.2     10.6     -3.0
OXTS2  00   Z    500     2     0       4.0      4.1     -1.0
OXTS2  12   Z    500     3     0       4.0      4.2      1.3
SWJS   00   Z    500     4     0       1.4      9.1      9.0

SWJS   12   Z    500     3     0       6.5     13.1     11.3
V2XO   00   Z    500     7     0       9.3     19.9     17.6
V2XO   12   Z    500     7     0      14.2     23.3     18.4
WPKD   00   Z    500     9     1      26.3     28.5     11.0
WPKD   12   Z    500    10     0      16.1     16.2      2.0

ZCBP6  00   Z    500     7     0      32.5     32.5     -1.0
ZCBP6  12   Z    500    10     0      16.3     35.3     31.3
03953  00   Z    500    30     0      10.9     13.0      7.0
03953  12   Z    500    30     0      11.3     14.0      8.3
04018  00   Z    500    30     0       7.3     17.4     15.8

04018  12   Z    500    30     0      10.1     14.4     10.3
04220  00   Z    500    30     0       9.0     11.7      7.5
04220  12   Z    500    31     0       8.0     10.0      6.0
04270  00   Z    500    30     0       8.6      9.6      4.3
04270  12   Z    500    31     0      10.0     10.3      2.4

04339  00   Z    500    30     0       8.1     16.0     13.8
04339  12   Z    500    31     0       7.1     16.2     14.6
04360  00   Z    500    29     0       7.3      9.4      6.0
04360  12   Z    500    31     0       9.3     10.2      4.2
08001  00   Z    500    27     0      13.6     15.6     -7.6

08001  12   Z    500    28     0      13.2     13.2     -0.5
08508  12   Z    500    30     0       7.2     10.7      7.9
08522  00   Z    500    29     0       7.1     11.0      8.4
08522  12   Z    500    31     0       5.8     11.1      9.5
08594  12   Z    500    11     0      10.4     10.5      1.3

60020  00   Z    500    26     0       6.3     11.2      9.2
60020  12   Z    500    29     0       7.5     13.6     11.3
71600  00   Z    500    29     0       9.1      9.1      0.3
71600  12   Z    500    31     0       7.8     12.7     10.1
72201  00   Z    500    30     0       5.4     14.3     13.3

72201  12   Z    500    31     0       7.1      9.9      6.8
72402  00   Z    500    29     0       6.3     11.5      9.7
72402  12   Z    500    30     0       8.9     11.3      7.0
74494  00   Z    500    29     0       7.8      8.5      3.3
74494  12   Z    500    31     0       5.7      7.4      4.7

78016  00   Z    500    30     0       8.2     14.7     12.1
78016  12   Z    500    30     0       8.7     19.9     17.9
```

# TABLE 12

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :100 hPa. |
| **Element monitored** | | :VECTOR WIND in m $s^{-1}$ |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :UBIAS,VBIAS | :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |

**GROSS ERROR LIMITS** :Defined in Appendix I.2

| WMO<br>IDENT | OBS<br>TIME | ELM | LEV | NUM<br>OBS | NUM<br>GROSS | %<br>REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| DASAPX | 00 | V | 100 | 11 | 0 | 0 | 6.3 | 1.2 | 2.0 |
| DASAPX | 12 | V | 100 | 15 | 0 | 0 | 6.1 | 0.1 | 1.5 |
| DASAP3 | 12 | V | 100 | 3 | 0 | 0 | 2.6 | 1.3 | -0.7 |
| DBBH | 12 | V | 100 | 3 | 0 | 0 | 9.4 | -3.2 | 4.9 |
| DBLK | 12 | V | 100 | 10 | 0 | 0 | 4.7 | 1.9 | 0.2 |
| FNOR | 00 | V | 100 | 7 | 0 | 0 | 5.2 | 1.4 | 0.1 |
| FNOR | 12 | V | 100 | 8 | 0 | 0 | 5.3 | 1.9 | -1.4 |
| FNOU | 00 | V | 100 | 11 | 0 | 0 | 3.6 | -0.9 | 0.9 |
| FNOU | 12 | V | 100 | 9 | 0 | 0 | 4.0 | 0.4 | 0.9 |
| FNPH | 00 | V | 100 | 7 | 0 | 0 | 3.1 | -1.1 | -0.1 |
| FNPH | 12 | V | 100 | 8 | 0 | 0 | 3.4 | -0.6 | 1.0 |
| FNRS | 00 | V | 100 | 6 | 0 | 0 | 4.6 | 0.4 | -1.1 |
| FNRS | 12 | V | 100 | 5 | 0 | 0 | 4.2 | 1.3 | 0.8 |
| LDWR | 00 | V | 100 | 30 | 0 | 0 | 1.7 | 0.2 | -0.3 |
| LDWR | 12 | V | 100 | 30 | 0 | 0 | 2.1 | -0.2 | -0.3 |
| OVYA2 | 00 | V | 100 | 3 | 0 | 0 | 5.2 | -1.5 | -2.6 |
| OVYA2 | 12 | V | 100 | 2 | 0 | 0 | 2.3 | 0.7 | 1.7 |
| OXTS2 | 00 | V | 100 | 2 | 0 | 0 | 4.5 | -2.0 | 1.6 |
| OXTS2 | 12 | V | 100 | 3 | 0 | 0 | 5.0 | 0.3 | 1.0 |
| SWJS | 00 | V | 100 | 4 | 0 | 0 | 2.8 | 1.2 | 2.2 |
| SWJS | 12 | V | 100 | 3 | 0 | 0 | 4.4 | 0.1 | -4.1 |
| V2XO | 00 | V | 100 | 5 | 0 | 0 | 4.2 | 0.6 | 0.3 |
| V2XO | 12 | V | 100 | 5 | 0 | 0 | 4.7 | 1.5 | -1.6 |
| WPKD | 00 | V | 100 | 7 | 0 | 0 | 3.9 | 1.4 | 2.4 |
| WPKD | 12 | V | 100 | 6 | 0 | 0 | 1.8 | 0.0 | -0.7 |
| ZCBP6 | 00 | V | 100 | 6 | 0 | 0 | 4.1 | 2.0 | -0.2 |
| ZCBP6 | 12 | V | 100 | 7 | 0 | 0 | 2.6 | -0.3 | 0.3 |
| 03953 | 00 | V | 100 | 30 | 0 | 0 | 2.7 | 0.5 | 0.5 |
| 03953 | 12 | V | 100 | 29 | 0 | 0 | 2.9 | -0.4 | 0.3 |
| 04018 | 00 | V | 100 | 30 | 0 | 0 | 2.6 | -0.1 | 0.6 |
| 04018 | 12 | V | 100 | 28 | 0 | 0 | 3.1 | 0.8 | 0.4 |
| 04220 | 00 | V | 100 | 30 | 0 | 0 | 3.1 | 0.5 | 0.2 |
| 04220 | 12 | V | 100 | 30 | 0 | 0 | 3.3 | -0.2 | 0.5 |
| 04270 | 00 | V | 100 | 29 | 0 | 0 | 3.8 | -0.5 | 0.2 |
| 04270 | 12 | V | 100 | 29 | 0 | 0 | 3.1 | -0.1 | 0.1 |
| 04339 | 00 | V | 100 | 29 | 0 | 0 | 4.1 | 1.2 | 0.3 |
| 04339 | 12 | V | 100 | 28 | 0 | 0 | 5.3 | -1.4 | 1.2 |
| 04360 | 00 | V | 100 | 29 | 0 | 0 | 3.4 | -0.8 | 0.4 |
| 04360 | 12 | V | 100 | 31 | 0 | 0 | 2.6 | 0.0 | -0.2 |
| 08001 | 00 | V | 100 | 26 | 0 | 0 | 4.9 | 1.7 | -0.8 |
| 08001 | 12 | V | 100 | 26 | 0 | 0 | 3.6 | 0.8 | 0.0 |
| 08508 | 12 | V | 100 | 14 | 0 | 0 | 3.8 | -0.5 | 0.3 |
| 08522 | 00 | V | 100 | 27 | 0 | 0 | 4.3 | -0.3 | -0.8 |
| 08522 | 12 | V | 100 | 29 | 0 | 0 | 5.4 | 0.7 | 2.7 |
| 08594 | 12 | V | 100 | 11 | 0 | 100 | 5.4 | -1.8 | 3.4 |
| 60020 | 00 | V | 100 | 25 | 0 | 0 | 5.1 | -0.1 | 0.6 |
| 60020 | 12 | V | 100 | 26 | 0 | 0 | 4.3 | 0.1 | -0.5 |
| 71600 | 00 | V | 100 | 29 | 0 | 0 | 4.9 | -0.5 | 0.6 |
| 71600 | 12 | V | 100 | 29 | 0 | 0 | 4.6 | 0.2 | -0.2 |
| 72201 | 00 | V | 100 | 30 | 0 | 0 | 3.9 | -1.2 | 0.3 |
| 72201 | 12 | V | 100 | 31 | 0 | 0 | 2.9 | 0.0 | 0.1 |
| 72402 | 00 | V | 100 | 29 | 0 | 0 | 4.4 | 0.4 | 0.2 |
| 72402 | 12 | V | 100 | 30 | 0 | 0 | 4.4 | 0.5 | 0.7 |
| 74494 | 00 | V | 100 | 26 | 0 | 100 | 3.2 | -0.1 | -0.1 |
| 74494 | 12 | V | 100 | 31 | 0 | 100 | 3.0 | 0.4 | 0.6 |
| 78016 | 00 | V | 100 | 29 | 0 | 0 | 5.7 | 0.8 | -1.5 |
| 78016 | 12 | V | 100 | 29 | 0 | 0 | 5.1 | 0.4 | 0.2 |

# TABLE 13

## MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
## MONITORING CENTRE: BRACKNELL
## MONTH: May 2002

**Monitoring procedures**

| | | |
|---|---|---|
| **Period** | | :One calendar month. |
| **Data monitored** | | :Reports from selected radiosonde TEMPs. |
| **Area monitored** | | :0°N - 90°N, 100°W - 40°E |
| **Standard of comparison** | | :Background field from UKMO global model. |
| **Position** | | :Average latitude and longitude for period. |
| **Observation times** | | :00, 12 UTC. |
| **Level monitored** | | :500 hPa. |
| **Element monitored** | | :VECTOR WIND in m $s^{-1}$ |
| **Parameters monitored** | :NUM OBS | :Number of observations available at level shown during period. |
| | :NUM GROSS | :Number of gross errors at level shown during period. |
| | :UBIAS,VBIAS: | Mean difference of observations of U and V components from background values at level shown excluding those with gross errors. |
| | :RMS | :Root Mean Square difference of observations from background values at level shown excluding those with gross errors. |

**GROSS ERROR LIMITS** :Defined in Appendix I.2

| WMO IDENT | OBS TIME | ELM | LEV | NUM OBS | NUM GROSS | % REJ | RMS | UBIAS | VBIAS |
|---|---|---|---|---|---|---|---|---|---|
| DASAPX | 00 | V | 500 | 14 | 0 | 0 | 3.5 | 1.1 | 0.5 |
| DASAPX | 12 | V | 500 | 13 | 0 | 0 | 5.2 | -0.4 | 1.2 |
| DASAP3 | 12 | V | 500 | 3 | 0 | 0 | 8.5 | 4.7 | -1.2 |
| DBBH | 12 | V | 500 | 3 | 0 | 0 | 4.9 | 1.2 | 3.0 |
| DBLK | 12 | V | 500 | 12 | 0 | 0 | 4.5 | 1.1 | -1.0 |
| FNOR | 00 | V | 500 | 9 | 0 | 0 | 3.2 | 0.0 | 1.0 |
| FNOR | 12 | V | 500 | 9 | 0 | 0 | 3.1 | 0.0 | 0.3 |
| FNOU | 00 | V | 500 | 12 | 0 | 0 | 4.1 | 0.4 | 0.2 |
| FNOU | 12 | V | 500 | 10 | 0 | 0 | 3.4 | -0.3 | 1.4 |
| FNPH | 00 | V | 500 | 10 | 0 | 0 | 2.8 | -0.7 | -0.3 |
| FNPH | 12 | V | 500 | 9 | 0 | 0 | 3.5 | -0.6 | -1.4 |
| FNRS | 00 | V | 500 | 11 | 0 | 0 | 3.3 | 1.2 | -0.2 |
| FNRS | 12 | V | 500 | 7 | 0 | 0 | 3.1 | -0.7 | 1.1 |
| LDWR | 00 | V | 500 | 30 | 0 | 0 | 3.8 | 0.0 | -0.1 |
| LDWR | 12 | V | 500 | 30 | 0 | 0 | 3.3 | 0.3 | -0.3 |
| OVYA2 | 00 | V | 500 | 2 | 0 | 50 | 16.5 | 9.6 | 8.1 |
| OVYA2 | 12 | V | 500 | 2 | 0 | 0 | 1.3 | 0.9 | 0.5 |
| OXTS2 | 00 | V | 500 | 2 | 0 | 0 | 5.4 | -4.4 | 2.7 |
| OXTS2 | 12 | V | 500 | 3 | 0 | 0 | 4.8 | -0.8 | 3.8 |
| SWJS | 00 | V | 500 | 4 | 0 | 0 | 4.9 | -2.1 | -2.7 |
| SWJS | 12 | V | 500 | 3 | 0 | 0 | 2.9 | 1.6 | 1.1 |
| V2XO | 00 | V | 500 | 7 | 0 | 0 | 4.1 | -2.8 | 0.6 |
| V2XO | 12 | V | 500 | 7 | 0 | 0 | 5.0 | 0.9 | 1.0 |
| WPKD | 00 | V | 500 | 10 | 0 | 0 | 2.6 | 0.7 | 0.3 |
| WPKD | 12 | V | 500 | 6 | 0 | 0 | 3.1 | -0.9 | 0.0 |
| ZCBP6 | 00 | V | 500 | 5 | 0 | 0 | 3.5 | 0.3 | -1.1 |
| ZCBP6 | 12 | V | 500 | 4 | 0 | 0 | 3.7 | -1.1 | -0.9 |
| 03953 | 00 | V | 500 | 30 | 0 | 0 | 3.9 | 0.1 | 0.2 |
| 03953 | 12 | V | 500 | 30 | 0 | 0 | 4.3 | 0.1 | -0.2 |
| 04018 | 00 | V | 500 | 30 | 0 | 0 | 3.3 | 0.1 | -0.1 |
| 04018 | 12 | V | 500 | 29 | 0 | 0 | 3.7 | 1.1 | -0.3 |
| 04220 | 00 | V | 500 | 30 | 0 | 0 | 3.6 | -0.3 | -0.1 |
| 04220 | 12 | V | 500 | 29 | 0 | 0 | 4.1 | 0.1 | 0.4 |
| 04270 | 00 | V | 500 | 30 | 0 | 0 | 3.9 | -0.4 | -0.8 |
| 04270 | 12 | V | 500 | 30 | 0 | 0 | 4.2 | -0.1 | -0.1 |
| 04339 | 00 | V | 500 | 30 | 0 | 0 | 4.6 | 0.7 | 0.1 |
| 04339 | 12 | V | 500 | 31 | 0 | 0 | 4.0 | 0.7 | -0.2 |
| 04360 | 00 | V | 500 | 29 | 0 | 0 | 4.3 | -0.8 | 0.7 |
| 04360 | 12 | V | 500 | 31 | 0 | 0 | 3.5 | -0.2 | 0.4 |
| 08001 | 00 | V | 500 | 27 | 0 | 0 | 4.8 | 0.3 | -0.2 |
| 08001 | 12 | V | 500 | 26 | 0 | 0 | 3.8 | -0.6 | -0.8 |
| 08508 | 12 | V | 500 | 16 | 0 | 0 | 4.6 | 1.5 | 0.5 |
| 08522 | 00 | V | 500 | 29 | 0 | 0 | 4.1 | 0.7 | 0.0 |
| 08522 | 12 | V | 500 | 30 | 0 | 0 | 4.1 | 1.1 | 0.3 |
| 08594 | 12 | V | 500 | 11 | 0 | 100 | 3.3 | -0.8 | 1.2 |
| 60020 | 00 | V | 500 | 26 | 0 | 0 | 3.5 | 0.6 | -0.5 |
| 60020 | 12 | V | 500 | 28 | 0 | 0 | 4.7 | -0.6 | 0.2 |
| 71600 | 00 | V | 500 | 29 | 0 | 0 | 3.6 | -0.9 | 0.2 |
| 71600 | 12 | V | 500 | 30 | 0 | 0 | 4.1 | 0.0 | 0.7 |
| 72201 | 00 | V | 500 | 30 | 0 | 0 | 3.0 | 1.0 | -0.6 |
| 72201 | 12 | V | 500 | 31 | 0 | 0 | 2.0 | 0.0 | -0.6 |
| 72402 | 00 | V | 500 | 29 | 0 | 0 | 3.0 | 0.9 | 0.0 |
| 72402 | 12 | V | 500 | 30 | 0 | 0 | 3.8 | -0.6 | 0.3 |
| 74494 | 00 | V | 500 | 29 | 0 | 100 | 4.1 | -1.6 | 0.2 |
| 74494 | 12 | V | 500 | 31 | 0 | 100 | 4.2 | -0.8 | 0.5 |
| 78016 | 00 | V | 500 | 30 | 0 | 0 | 3.5 | 0.2 | -0.3 |
| 78016 | 12 | V | 500 | 30 | 0 | 0 | 4.1 | 0.0 | 0.8 |

# APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

| Level (hPa) | Geopotential height (metres) |
|---|---|
| 1000 | 100 |
| 850 | 100 |
| 700 | 100 |
| 500 | 150 |
| 400 | 175 |
| 300 | 200 |
| 250 | 225 |
| 200 | 250 |
| 150 | 275 |
| 100 | 300 |
| 70 | 375 |
| 50 | 400 |
| 30 | 450 |

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

| Level (hPa) | Weight |
|---|---|
| 1000 | 3.70 |
| 850 | 3.40 |
| 700 | 2.90 |
| 500 | 2.20 |
| 400 | 1.90 |
| 300 | 1.60 |
| 250 | 1.50 |
| 200 | 1.37 |
| 150 | 1.19 |
| 100 | 1.00 |
| 70 | 0.87 |
| 50 | 0.80 |
| 30 | 0.64 |

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

| Level (hPa) | Windspeed m s$^{-1}$ |
|---|---|
| 1000 | 35 |
| 850 | 35 |
| 700 | 40 |
| 500 | 45 |
| 400 | 50 |
| 300 | 60 |
| 250 | 60 |
| 200 | 50 |
| 150 | 50 |
| 100 | 45 |